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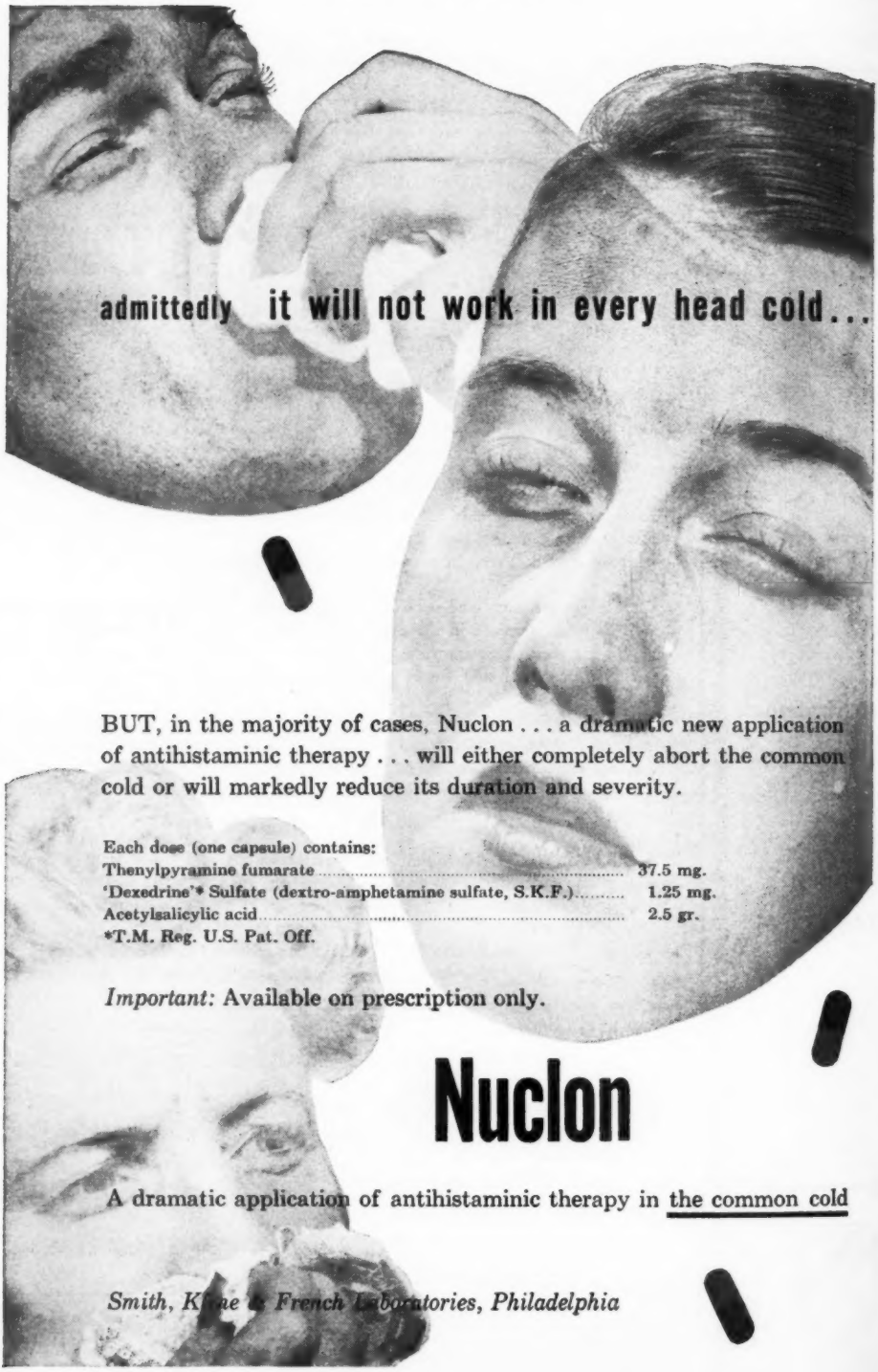

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*Derzavis, J. L.; Rice, J. S., and Leland, L. S.: Topical Bacitracin Therapy of Pyogenic Dermatoses; a Clinical Report, J.A.M.A. *141*:191 (Sept. 17) 1949.

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*Anderson, J. and Steele, C.: *Use of Nitrofuran Therapy in External Otitis,* Laryngoscope 58:1279, 1948 • Douglass, C.: *The Use of Furacin in the Treatment of Aural Infections,* Laryngoscope 58:1274, 1948 • Reardon, H.: *Unpublished results.*

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Minnesota[5]	5000	535	10.7
Illinois[6]	4478	601	13.4
Oklahoma[7]	924	92	10.0
Washington[8]	1526	164	10.7
California[9]	1341	92	6.9
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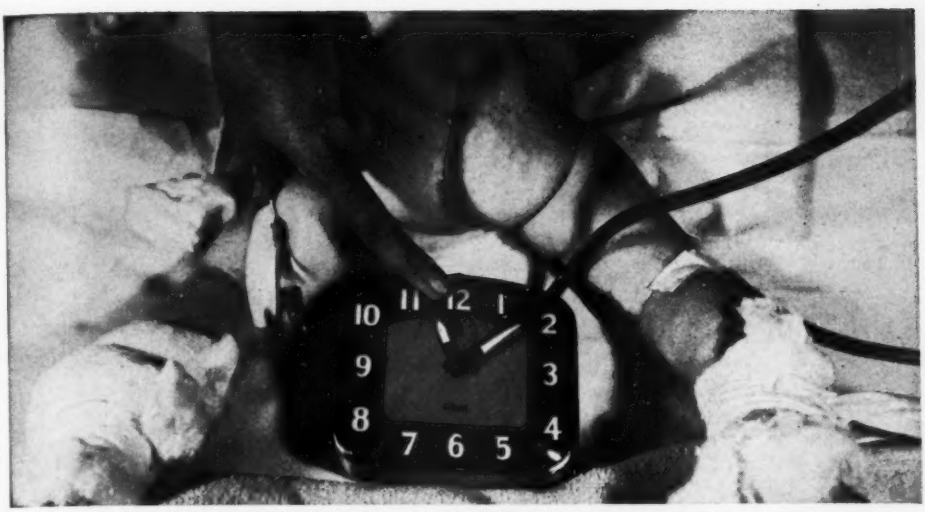

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1. Schwartzman, J.: Scientific exhibit at the American Academy of Pediatrics, San Francisco, Nov. 14-17, 1949.
2. Hechter, O.; Dopkeen, S. K., and Yudell, M. H.: The Clinical Use of Hyaluronidase in Hypodermoclysis, J. Pediat. 30:645 (June) 1947.

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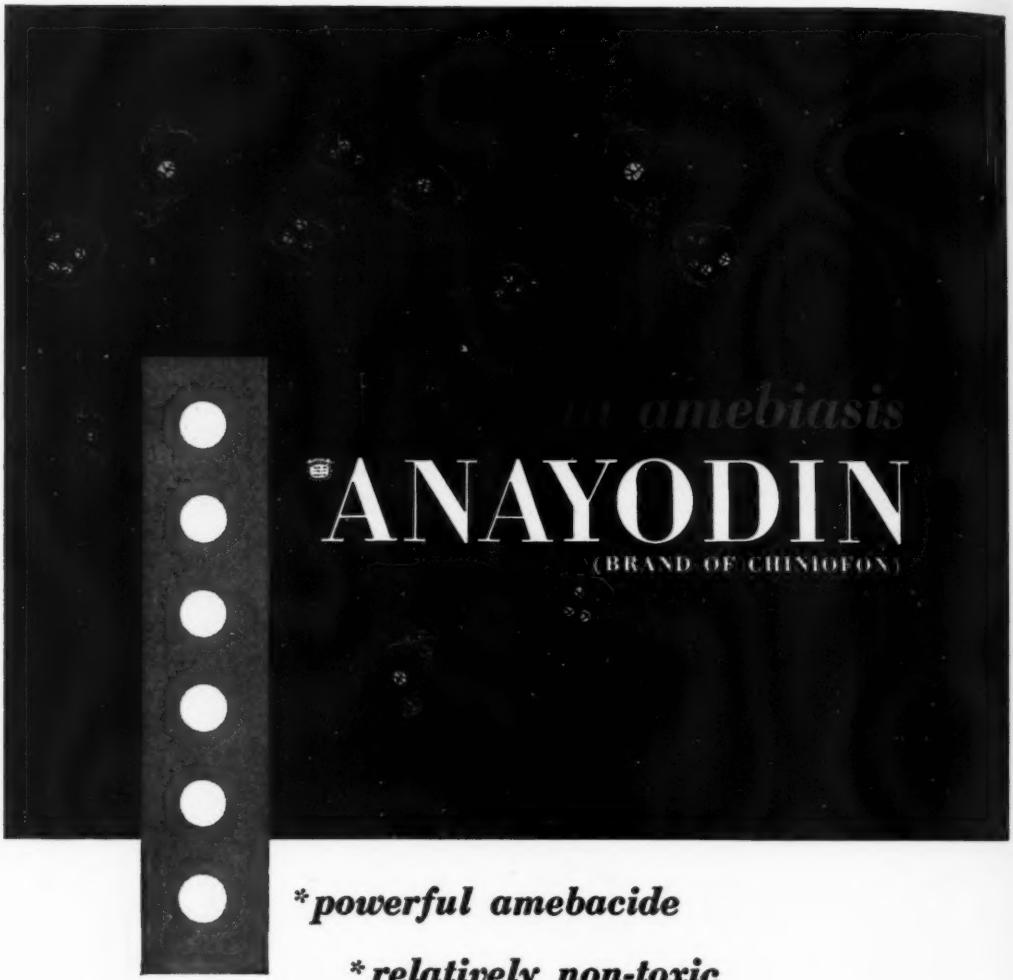

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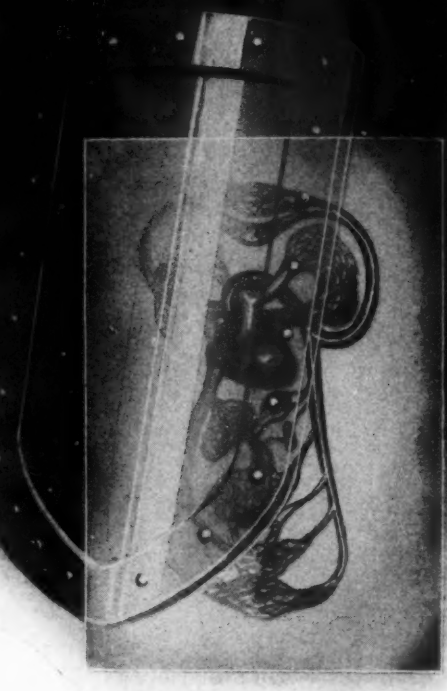

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Flashing in the Cuban sun, machetes chop the moist green stems of sugar cane in a race against the coming of the tropical rains.

Sugar, used since antiquity in medicine, is now utilized at the rate of over sixty million pounds each year in the pharmaceutical industry.

Lilly standards, even for sugar, make demands beyond official requirements and specify such details as size of granule, degree of hardness and whiteness on drying, and the acceptable type of shipping container. Such exacting control of all ingredients is the reason that Lilly products are uniform from lot to lot, from original prescription to refill. The patient's continued confidence is thereby steadfastly maintained in the drug, in the pharmacist, and in the prescriber.

Lilly

ELI LILLY AND COMPANY
INDIANAPOLIS 6
INDIANA, U.S.A.

no tripping on the psychic hurdle

Apprehension and anxiety
accompanied by tenseness
are usually the first
and often the last obstacles
in the path of successful therapy.
Sedation with 'Amytal'
(Amobarbital, Lilly)
in proper dosage is gently quieting
and does not induce
the "drugged" depression of spirits
so frequently observed
after the repeated use
of longer-acting barbiturates.
Unlike the latter,
which depend on kidney function
for elimination,
'Amytal' is destroyed in the body
and may be used more satisfactorily
in cases of renal damage.

Lilly

Detailed information and literature on 'AMYTAL' PRODUCTS are supplied through your M.S.R.*

*M.S.R.—Lilly Medical SERVICE Representative

SPOIL THE APPETITE . . .

CONTROL OF APPETITE is frequently beyond the power of human will, a fact that explains most cases of obesity. Fortunately, appetite can be checked by administration of certain sympathomimetic drugs, such as *Propadrine*® phenylpropanolamine HCl, a development of Sharp & Dohme research notably free of the unpleasant side effects associated with ephedrine. ALTEPOSE tablets, a new formula for control of obesity, provide PROPADRINE HCl, 50 mg. (¾ gr.), to reduce the desire to eat; *thyroid*, 40 mg. (⅔ gr.), to increase metabolism; and DELVINAL® vinbarbital, 25 mg. (⅜ gr.), for mild sedation. ALTEPOSE tablets spare the obese patient the pangs of hunger, making low-calorie diets more acceptable, speed metabolism of excess fat and carbohydrate, and tend to suppress nervous tension and anxiety. The proper dose must be determined for each individual. ALTEPOSE tablets are supplied in bottles of 100 and 1,000. Sharp & Dohme, Philadelphia 1, Pa.

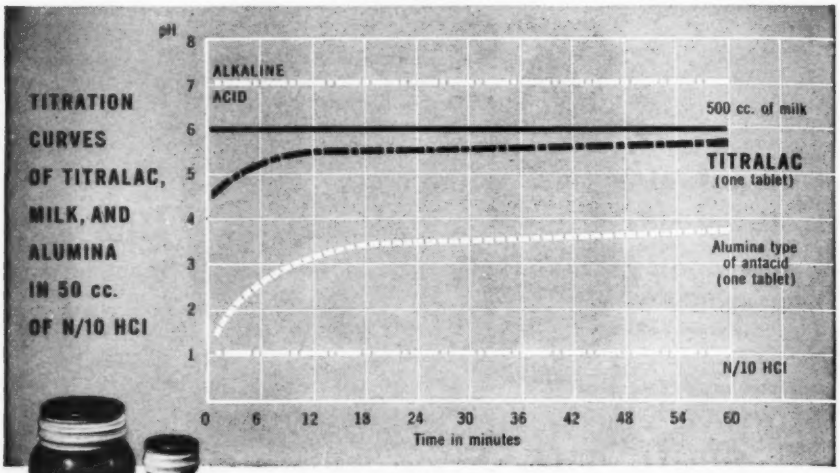
spare the patient

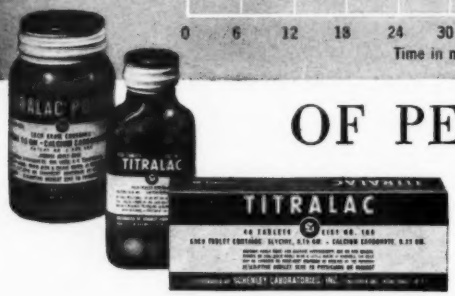
SHARP & DOHME

Altepose® TABLETS

for treatment of obesity

NON-SURGICAL TREATMENT





OF PEPTIC ULCER

Gastroenterologists have long endorsed the use of milk, when practicable, for its ideal acid-converting power and buffering capacity.[1, 2] In a recent comprehensive paper, Aaron[3] and others[4, 5, 6] express a preference for calcium carbonate as the antacid to be employed.

TITRALAC, by combining proper proportions of purified calcium carbonate and the amino acid glycine, *provides an acid-converting and buffering effect practically equivalent to that of fresh milk*, as shown in the above chart.* Just 1 TITRALAC tablet is equivalent to an 8-ounce glass of milk in antacid effect and provides quick and long-lasting relief from the distressing symptoms of hyperacidity.

The very agreeable taste of soft-massed TITRALAC tablets, which is achieved without employing taste-disguising, acid-generating sugars in the formula, makes them as acceptable to patients as an after-dinner mint. Prescribing TITRALAC eliminates the probability of unfavorable reactions often associated with the taking of metallic-tasting, astringent tablets or liquids, and ensures adherence to the prescribed dosage.

TITRALAC tablets are supplied in bottles of 100 and convenient-to-carry packages of 40. TITRALAC powder is also available, in 4-oz. jars.

REFERENCES

1. Rossett, N. E., and Flexner, J.: Ann. Int. Med. 18: 193 (1944). 2. Freezer, C. R. E.; Gibson, C. S., and Matthews, E.: Guy's Hosp. Reports 78: 191 (1928). 3. Aaron, A. H.; Lipp, W. F., and Milch, E.: J. A. M. A. 139: 514 (Feb. 19) 1949. 4. Kirsner, J. B., and Palmer, W. L.: Illinois M. J. 94: 357 (Dec.) 1948. 5. Kimball, S.: in Practice of Medicine (Tice). Hagerstown, Md., W. F. Prior Company, Inc., 1948; p. 210. 6. Special Article: M. Times 76: 10 (Jan.) 1948.

* The formula of TITRALAC is one whose composition and mode of action are recognized by U.S. Patent No. 2,429,596.

Samples and literature to physicians upon request.

SCHENLEY LABORATORIES, INC., 350 FIFTH AVENUE, NEW YORK 1, N. Y.

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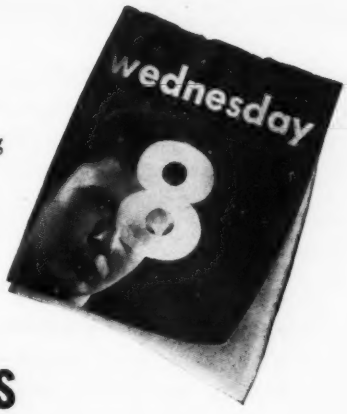
"better today than yesterday"

To help the patient feel better today than she did yesterday, a good tonic is often all that is needed. In addition to its tone-restoring and appetite-stimulating effects, your patient's "tonic" is an ever-present symbol of the reassuring and comforting fact that she is "in the care of her physician".

Smith, Kline & French Laboratories, Philadelphia



Eskay's Neuro Phosphates

a palatable and effective tonic

Each adult dose, 2 fluid drams (2 teaspoonfuls), contains:

Alcohol	10 per cent
Strychnine glycerophosphate, anhydrous	1/64 grain
Sodium glycerophosphate	2 grains
Calcium glycerophosphate	2 grains
Phosphoric acid, 75%	1.7 minims

Available in 12 fl. oz. bottles

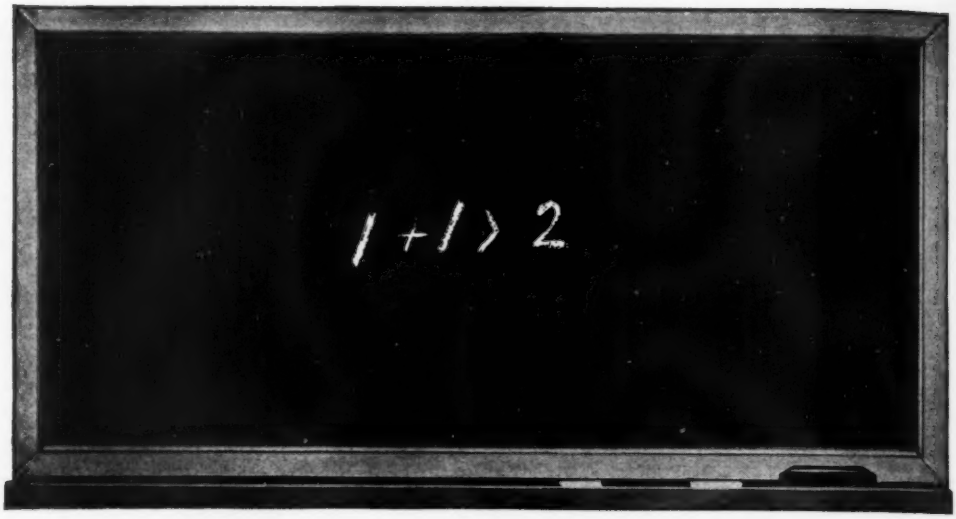
Eskay's Theranates

the formula of famous Neuro Phosphates, plus Vitamin B_1

Available in 12 fl. oz. bottles

they are prescribed so widely

because they work so well



To state that one and one make more than two is unacceptable mathematically. But pharmacologically, it is a simple fact that a *Cholmodin* (Brand) tablet represents more than the sum of its two ingredients in the correction of constipation.

Cholmodin tablets contain deoxycholic (bile) acid in combination with a small amount of extract of aloe. Emodin, hydrolyzed from aloe, is a specific colon stimulant. Deoxycholic acid activates the hydrolysis of aloe through its uniquely high surface activity. The low aloe content of *Cholmodin* is thereby spread out over a large area of the colon, and the emodin is liberated very evenly. Thus, *Cholmodin* produces its typically mild, non-griping, corrective action, usually resulting in a soft and formed stool without loss of water.

Cholmodin (Brand) tablets are widely indicated and may safely be given for correction of habitual and "atonic" constipation in all types of patients.

Cholmodin

BRAND

Each tablet contains 1½ gr. (0.1 Gm.) deoxycholic acid, a natural eliminant; and ¾ gr. (0.05 Gm.) extract of aloe. Bottles of 50 and 500 tablets.

Cholmodin, Trademark Reg. U. S. Pat. Off.

AMES COMPANY, INC., ELKHART, INDIANA

infant anorexia rapidly disappears

Just five drops daily of White's Multi-Beta Liquid stimulates the infant appetite; weight increase is favorably influenced and greater resistance to infection exhibited—the early infant's vitamin B intake is at a safe range.

Similarly in the adult, White's Multi-Beta Liquid, in teaspoon dosage, helps replenish and maintain adequate vitamin B stores—corrects deficiency-induced anorexia, aids in patient recovery, improves special or restricted dietaries.

EXCELLENT PRESCRIPTION INGREDIENT

Palatable, non-alcoholic and stable, White's Multi-Beta Liquid is ideally suited to prescription use. Compatible with such ingredients as: (1) Tincture Nux Vomica, in equal parts, (2) Elixir Phenobarbital, 1 to 4 parts, (3) White's Mol-Iron Liquid, 1 to 8 parts.

White's **MULTI-BETA LIQUID**

. . . multi-purpose **B complex** source

WHITE LABORATORIES, INC., *Pharmaceutical Manufacturers*, NEWARK 7, N. J.

The Whole is Greater than its Parts...

Light, when broken into its components, as when it passes through a prism to evoke a series of colors, is less luminous — generally less useful — than the original white ray.

Similarly, unless all components of the vitamin B complex are present and reach the body cells in optimal amounts, normal nutrition is impossible.

Breonex*-L (Soluble) is a concentration of all the principal factors of the B complex so prepared and administered that it reaches all the body cells.

Brenoex-L is potent — it is stable — and remains so until you are ready to begin its administration. Then it re-dissolves almost instantly in the diluent from the companion vial.

Each vial of the desiccated powder contains: thiamine hydrochloride 150 mg.; riboflavin 50 mg.; pyridoxine hydrochloride 25 mg.; calcium pantothenate 25 mg.; and nicotinamide 500 mg.

*Trademark of George A. Breon & Co.

BREONEX
AQUEOUS DILUENT
BREONEX (Soluble)
BREON
Breonex-L
(SOLUBLE)
Personifies convenience and adaptability. The concentration per cc may be varied by the amount of diluent used; the multiple-dose vial affords further variable dosage.

George A. Breon & Company
KANSAS CITY, MISSOURI
RENSSELAER, N. Y.
ATLANTA
SAN FRANCISCO

In sickness or surgery, play safer with . . .

"Saturation Dosage"

of vitamins b *and* c

Depletion of the critical water-soluble B complex and C vitamins occurs so commonly in the presence of physical pathology, as to make a presumption of nutritive impairment[2] almost axiomatic. Essential to normal cell metabolism and wound healing, these poorly-stored, readily-diffusible factors must be replenished — usually by *massive dosage* —if tissue rehabilitation[3] and return to health[4] are to be expedited. • Allbee with C 'Robins' provides this all-important "saturation dosage" in convenient capsule form. It incorporates the important B factors in 2 to 15 times daily requirements, plus 250 mg. of vitamin C — *the highest strength of ascorbic acid available today in a multi-vitamin capsule.* • Its prescription represents a sound contribution toward decisive recovery from disease, or toward pre- and post-operative nutritional support.[1]

A. H. ROBINS CO., INC. • RICHMOND 20, VA.

Ethical Pharmaceuticals of Merit since 1878

FORMULA: *Each Allbee with C capsule contains:*

Thiamine hydrochloride (B_1)	15 mg.
Riboflavin (B_2)	10 mg.
Nicotinamide	50 mg.
Calcium pantothenate	10 mg.
Ascorbic acid (C)	250 mg.

REFERENCES: 1. Coller, F. A. and DeWeese, M. S.: Preoperative and Postoperative Care, J.A.M.A., 141:641, 1949. 2. Jolliffe, N. and Smith, J. J.: Med. Clin. North America, 27:567, 1943. 3. Kruse, H. D.: Proc. Conf. Convalescent Care, New York Acad. Med., 1940. 4. Spies, T. D.: Med. Clin. North America, 27:273, 1943.

allbee® WITH C

Robins

Patient under Treatment

FOR URINARY

TRACT INFECTION

meantime enjoys

Gratifying Relief

from distressing symptoms

With orally administered Pyridium—an effective, *safe* urinary analgesic—physicians can give patients with urinary tract infection prompt relief from such symptoms as urinary frequency and pain and burning on urination.

Pyridium in therapeutic dosage is virtually nontoxic and may be administered throughout the course of treatment with streptomycin, penicillin, the sulfonamides, or other specific therapy.

Pyridium is the trade-mark of Nepera Chemical Co., Inc., successor to Pyridium Corporation, for its brand of phenylazo-diamino-pyridine HCl. Merck & Co., Inc. sole distributor in the United States.

The complete story of Pyridium and its clinical uses is available upon request.

Pyridium®

(Brand of Phenylazo-diamino-pyridine HCl)

MERCK & Co., Inc. Manufacturing Chemists RAHWAY, N. J.

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YOU KNOW HIM WELL . . .

the patient past 40, presenting a vague syndrome of epigastric distress, annoying dyspepsia, flatulence and chronic constipation.

In a great many of these patients, a mild disturbance of the biliary tract is the cause of this syndrome. By virtue of the correlated actions of CHOBILE, the disturbed biliary mechanism may be quickly restored to full competency . . . together with a marked improvement in the patient's well-being and working efficiency.

CHOBILE supplies the active principles of natural bile to improve digestion *plus* Ketocholanic Acids to flush the biliary passages with a copious flow of low-viscosity bile. Thus, CHOBILE accomplishes true bile salt replacement to improve the functions of the alimentary tract *plus* non-surgical drainage of the biliary tree to overcome biliary stasis.

Each CHOBILE Tabule contains: Cholic Acid (conjugated as sodium glycocholate and sodium taurocholate) 1½ grains; Ketocholanic Acids 1½ grains. Supplied in bottles of 100, 500, 1000.

Literature and samples on request.

CHOBILE®

PRESCRIBED FOR MORE THAN *7 YEARS*

IRWIN, NEISLER & COMPANY • DECATUR, ILLINOIS

More Red Blood from a Capsule....

HEMOSULES*
'WARNER'

Hematinic capsules for hypochromic anemias.

HEMOSULES* 'Warner' are high-potency, vitamin-rich capsules which also contain liver concentrate and highly absorbable ferrous sulfate.

Indications In Nutritional Deficiencies—*Hemosules* 'Warner'*
In Obstetrics—*Hemosules* 'Warner'*
In Gastroenterology—*Hemosules* 'Warner'*
In Infectious Diseases—*Hemosules* 'Warner'*
In Anemias of Acute or Chronic Blood Loss—*Hemosules* 'Warner'*
In all Secondary Anemias—*Hemosules* 'Warner'*

Dosage Two HEMOSULES* Capsules t.i.d. in well defined hypochromic anemias. One to three HEMOSULES* Capsules for prophylaxis and/or maintenance.

Package Information

Available in bottles of 96, 250 and 1,000

Formula Each capsule contains:

Ferrous sulfate, Dried U.S.P. 162.0 mg....(2.5 grs.)
Liver concentrate (1:20) 162.0 mg....(2.5 grs.)
*Folic acid**...0.75 mg.*
Thiamine hydrochloride (vitamin B_1)...1.0 mg.
Riboflavin (vitamin B_2)...1.0 mg.
Niacinamide...4.0 mg.
Pyridoxine hydrochloride (vitamin B_6)...0.5 mg.
*Calcium pantothenate**...0.5 mg.*
Ascorbic acid (vitamin C)...15.0 mg.

**Trade Mark*
***The need for pyridoxine hydrochloride, calcium pantothenate and folic acid in human nutrition has not been established.*
†The minimum daily requirement for niacinamide has not been established.

WILLIAM R. WARNER & CO., INC.
New York St. Louis

NEW!

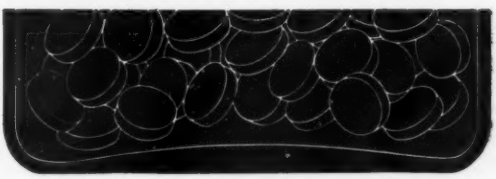
Carmethose-Trasentine

Doubly effective in relieving gastric discomfort...

Carmethose-Trasentine is a logical combination of a new *antacid* and an effective *antispasmodic* to control gastric discomfort.

Controls hyperacidity . . . This combination lowers gastric acidity and forms a protective coating which has been observed in the stomach for as long as three hours.

Controls spasm . . . Carmethose-Trasentine relieves gastric pain also by relaxing smooth muscle spasm. The anesthetic effect of Trasentine further controls gastric irritability. Carmethose-Trasentine is non-constipating, palatable and eliminates acid-rebound.



Issued: Carmethose-Trasentine Tablets: sodium carboxymethylcellulose, 225 mg.; magnesium oxide, 75 mg.; Trasentine, 25 mg. Bottles of 100.
Carmethose without Trasentine is also available for use in cases where the antispasmodic component is considered unnecessary. Available as Tablets, each containing sodium carboxymethylcellulose 225 mg., with magnesium oxide 75 mg., and as Liquid, a 5% solution of carboxymethylcellulose.

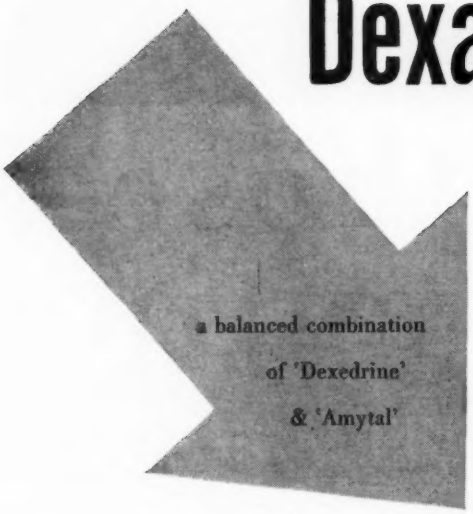
CARMETHOSE T.M. (brand of carboxymethylcellulose)
TRASENTINE ® (brand of adiphenine)

Ciba *Pharmaceutical Products, Inc.,*
Summit, N. J.

2-1566M

S.K.F. announces

Dexamyl



the remarkable new preparation for relieving mental and emotional distress

In 'Dexamyl', the two components—'Dexedrine'* and 'Amytal'†—work together* to ameliorate mood; to relieve inner tension; and thus to control troublesome symptoms of mental and emotional distress:

The 'Dexedrine', because of its "smooth" and profound antidepressant action, restores mental alertness and optimism and dispels psychogenic fatigue.

The 'Amytal', because of its calming action, relieves nervous tension, anxiety and agitation.

Widely useful in everyday practice, 'Dexamyl' tablets are available on prescription only in bottles of 50. Each tablet contains 'Dexedrine' Sulfate (dextro-amphetamine sulfate, S.K.F.) 5 mg. and 'Amytal' (Amobarbital, Lilly) ½ grain (32 mg.).

*Trademark, S.K.F. †Trademark, Lilly

Smith, Kline & French Laboratories, Philadelphia

a newly accepted therapy

Mounting clinical evidence, now accepted by the Council on Pharmacy and Chemistry of the American Medical Association, continues to support the claims made for the efficacy of Resinat. The most recent studies, for example, demonstrate that complete symptomatic relief occurs in from 48 to 72 hours and is accompanied by regression of the ulcer crater in from two to four weeks, as seen in most of the 120 patients treated with Resinat.[1]

Resinat acts as an adsorbent which effectively neutralizes excess gastric acidity. It does not cause constipation nor does it produce acid rebound or other objectionable side effects.

Resinat is available in Capsules (0.25 Gm.), Tablets (0.5 Gm.), Powder (1 Gm.).

1. Weiss, S., Espinal, R. B. & Weiss, J.: Therapeutic Application of Anion Exchange Resins in the Treatment of Peptic Ulcer, Review of Gastroenterology, 16:501-509, June, 1949.

Literature and samples available.

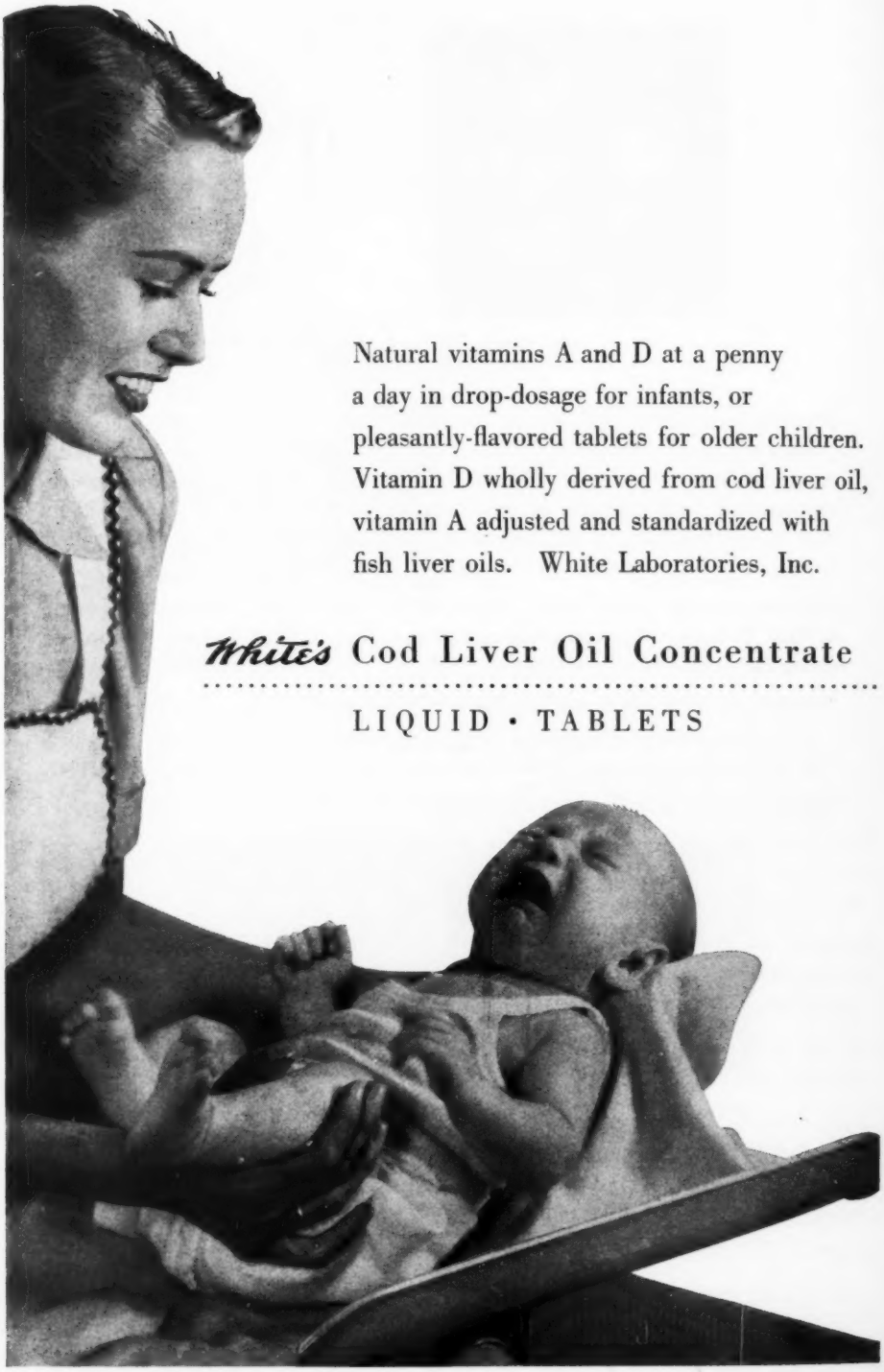
RESINAT Resinat Patent Pending

brand of polyamine-methylene resin

for peptic ulcer

THE NATIONAL DRUG COMPANY **PHILADELPHIA 44, PA.**

More than Half a Century of Service *to the Medical Profession.*



Natural vitamins A and D at a penny
a day in drop-dosage for infants, or
pleasantly-flavored tablets for older children.
Vitamin D wholly derived from cod liver oil,
vitamin A adjusted and standardized with
fish liver oils. White Laboratories, Inc.

White's Cod Liver Oil Concentrate

LIQUID • TABLETS

when pregnancy is contraindicated . . .

Another **COMPARATIVE STUDY**

THE EFFICACY OF THE SUPPOSITORY FOR CONCEPTION CONTROL

"... effectiveness depends primarily on acceptability and, in general, the simpler the method the more acceptable and, therefore, the more effective."*

The efficacy of the Lorophyn Suppository technic was determined on over 500 women in Baltimore and South Carolina studies. The results proved that this simple, acceptable technic is highly effective. The authors concluded that

"... mass studies on the diaphragm have not shown greater efficacy than is reported in this paper by simpler procedures."*

* Eastman, N. J. & Seibels, R. E.: *The Efficacy of the Suppository and of Jelly Alone as Contraceptive Agents*, J. A. M. A. 139:16 (Jan. 1) 1940.

"More recently a comparison has been made in our clinic of the results achieved in a large series of patients who have been using suppositories containing phenylmercuric acetate for over five years, with the results obtained in a comparable series of women who have employed the diaphragm and jelly. The results, as shown in Table 2, indicate that pregnancy rates were quite similar . . ."

Eastman, N. J.: *Further Observations on the Suppository as a Contraceptive*, South. M. J. 42:346 (April) 1949.

Reprints on request.

Lorophyn® Suppositories (N.N.R.) contain phenylmercuric acetate 0.05% and glyceryl laurate 10% in a water-dispersible, self-emulsifying, synthetic wax base. Hermetically sealed in foil, they will not leak in hot weather.

EATON LABORATORIES, INC., NORWICH, N. Y.

When a jelly is preferred—**LOROPHYN JELLY (N.N.R.)** also contains the powerful spermicide: phenylmercuric acetate 0.05%, and polyethylene glycol of mono-iso-octyl phenyl ether 0.3%, methyl p-hydroxy benzoate 0.05% and sodium borate 3% in a special jelly base.

a **new**
antibacterial
agent...

Wide antibacterial activity, low toxicity and virtual elimination of renal complications distinguish the use of Gantrisin* 'Roche', a new and remarkably soluble sulfonamide. Highly effective in urinary as well as systemic infections, Gantrisin does not require alkali therapy because it is soluble even in mildly acid urine. More than 20 articles in the recent literature attest its high therapeutic value and the low incidence of side-effects. Gantrisin is now available in 0.5 Gm tablets, as a syrup, and in ampuls. Additional information on request.

HOFFMANN-LA ROCHE INC • NUTLEY 10 • N. J.

Gantrisin®

* *Brand of sulfisoxazole (3,4-dimethyl-5-sulfanilamido-isoxazole)*

'Roche'

Pabalate produces higher blood salicylate levels

for better antirheumatic therapy

Each enteric-coated Pabalate Tablet, or each teaspoonful of the chocolate-flavored Pabalate Liquid, contains sodium salicylate, U.S.P. (5 gr.) 0.3 Gm.; para-aminobenzoic acid, as the sodium salt, (5 gr.) 0.3 Gm.

PABALATE®

the dependable antirheumatic—available in both tablets and liquid, for more convenient administration to patients of all ages!

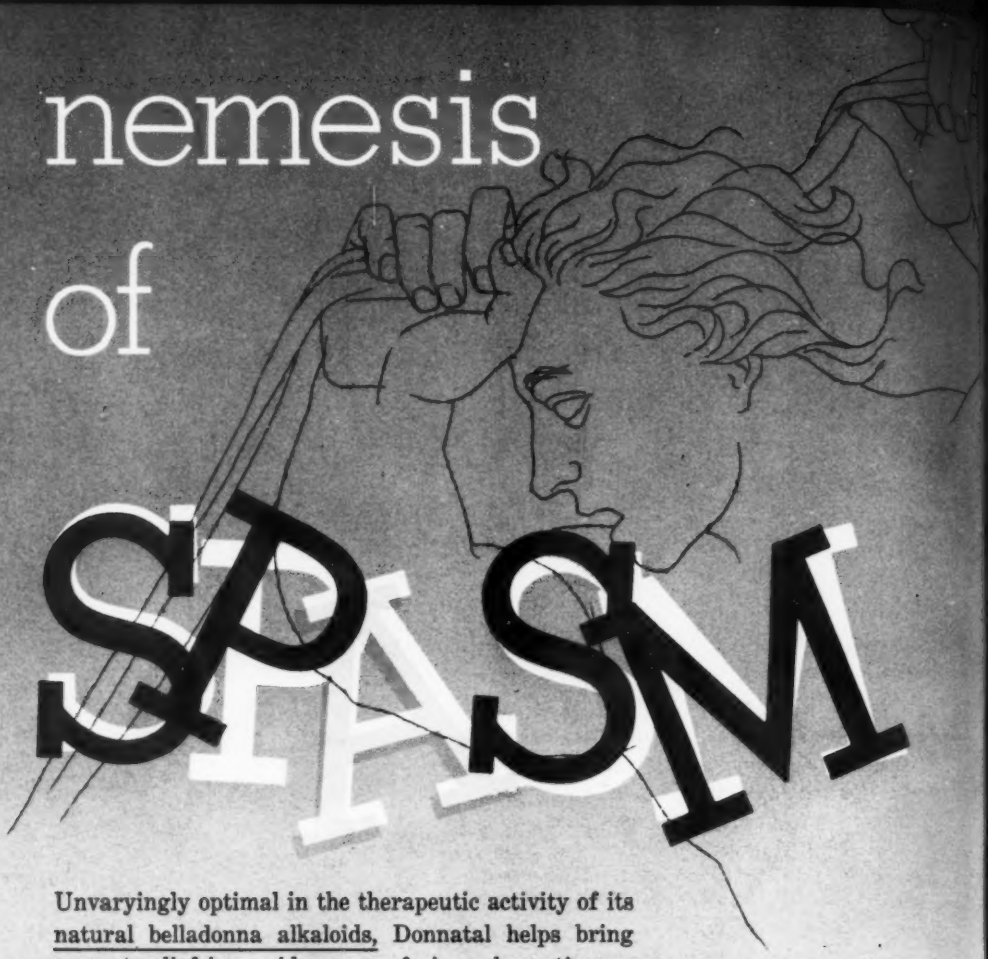
1. Rosenblum, H. and Fraser, L. E.: Proc. Soc. Exper. Biol. and Med., 65: 178, 1947.
2. Dry, T. L., et al.: Proc. Staff Meetings Mayo Clin., 21: 497, 1946.
3. Belisle, M.: Union Med. Can., 77: 392, 1948.

Robins

A. H. Robins Co., Inc. · Richmond 20, Virginia

ETHICAL PHARMACEUTICALS OF MERIT SINCE 1878

nemesis of SPASM



Unvaryingly optimal in the therapeutic activity of its natural belladonna alkaloids, Donnatal helps bring prompt relief in a wide range of visceral spastic conditions. Integral with these potent spasmolytic agents is a minimal phenobarbital content, affording practical sedation against psychogenic stimuli. Donnatal's broad professional acceptance stems from its superior efficacy, notable economy, and more-than-marginal safety. Elixir Donnatal constitutes also a highly palatable therapeutic vehicle for adjuvant medication. Available in Tablets, Capsules, and Elixir.

Formula: Each Tablet or Capsule, and each 5 cc. of Elixir contains: Hyoscyamine Sulfate, 0.1037 mg.; Atropine Sulfate, 0.0194 mg.; Hyoscine Hydrobromide, 0.0065 mg.; Phenobarbital (¼ gr.), 16.2 mg.

SPASM

donnatal®

Robins

A. H. Robins Co., Inc. · Richmond 20, Virginia

ETHICAL PHARMACEUTICALS OF MERIT SINCE 1878

AUREOMYCIN

HYDROCHLORIDE LEDERLE

in Coliform Infections

Aureomycin has been found to exert a dramatic effect in the treatment of *Escherichia coli* infections; including peritonitis, bacteremia, urinary infections, meningitis and brain abscess. The prognosis in many of these infections has in the past been guarded, but the advent of aureomycin renders prompt recovery more likely.

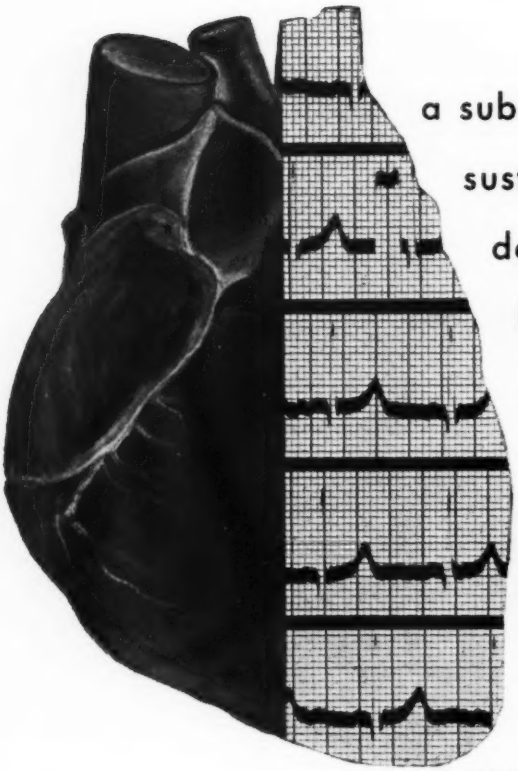
AUREO-MYCIN

Capsules: Bottles of 25, 50 mg. each capsule.
Bottles of 16, 250 mg. each capsule.

Ophthalmic: Vials of 25 mg. with dropper; solution prepared by adding 5 cc. of distilled water.

Aureomycin has also been found effective for the control of the following infections: African tick-bite fever, acute amebiasis, bacterial and virus-like infections of the eye, bacteroides septicemia, boutonneuse fever, acute brucellosis, Gram-positive infections (including those caused by streptococci, staphylococci, and pneumococci), Gram-negative infections (including those caused by the coli-aerogenes group), granuloma inguinale, *H. influenzae* infections, lymphogranuloma venereum, peritonitis, primary atypical pneumonia, psittacosis (parrot fever), Q fever, rickettsialpox, Rocky Mountain spotted fever, subacute bacterial endocarditis resistant to penicillin, tularemia and typhus.

LEDERLE LABORATORIES DIVISION AMERICAN Cyanamid COMPANY 30 Rockefeller Plaza, New York 20, N. Y.



a substantial,
sustained
decline in
blood pressure
towards
normotension

HAIMASED
(TILDEN)

in **hypertension**

HAIMASED (Tilden) presents Sulfocyanate (Thiocyanate) therapy at its best . . . the *first* liquid Sulfocyanate product introduced in the United States . . . stable, palatable, easy-to-take, sugar-free.

Judiciously administered, HAIMASED is a reliable aid in reducing elevated blood pressure and controlling its symptoms in a gratifying percentage of hypertensive patients. In many cases pressure declines 30 to 50 mm. Hg. and *stays down*.

Each 100 cc. of HAIMASED represents 4.4 Grams (20 grains to the fluid ounce) of Sodium Sulfocyanate.

sample and literature upon physician's request

The TILDEN Company • NEW LEBANON, N. Y. • ST. LOUIS 3, MO

OVER 125 YEARS OF FAITHFUL SERVICE
TO THE MEDICAL PROFESSION . . . BY THE
OLDEST MANUFACTURING PHARMACEUTICAL
HOUSE IN AMERICA! FOUNDED 1824

highly effective in an unusually wide range of common skin disorders

Pragmatar is particularly useful in seborrheic dermatitis, and in the general care and hygiene of the seborrheic scalp.

Pragmatar often brings dramatic improvement in the common fungous infections — even in "athlete's foot."

Pragmatar is extremely valuable in eczematous eruptions, especially those in which a seborrheic factor is involved.

Smith, Kline & French Laboratories, Philadelphia

Pragmatar

the outstanding tar-sulfur-salicylic acid ointment

with

MANDELAMINE

REG. U. S. PAT. OFF.

Brand of Methenamine Mandelate

URINARY ANTISEPTIC

Extensive clinical use of MANDELAMINE* in the management of urinary-tract infections requiring prolonged antisepsis, has established there is little or no danger that bacteria will develop resistance to this drug.

Wilhelm et al.[1] observed no instance of drug-fastness while treating 47 cases of persistent A. aerogenes infection. In some patients therapy was continued for as long as five weeks. These findings on the sustained antibacterial effectiveness of MANDELAMINE confirm the conclusions of Scudi and Duca,[2] Butt,[3] and others.

MANDELAMINE is indicated in pyelonephritis, nephroptosis, nephroptosis with pyelitis, cystitis, prostatitis, nonspecific urethritis and infections associated with urinary calculi or neurogenic bladder.

6

OUTSTANDING ADVANTAGES OF MANDELAMINE

1 Wide antibacterial range, including both gram-negative and gram-positive organisms

2 No supplementary acidification required (except when urea-splitting organisms occur)

3 Little or no danger of drug-fastness

4 Exceptionally well tolerated

5 No dietary or fluid regulation.

6 Simplicity of regimen—3 or 4 tablets t.i.d.

*MANDELAMINE is the registered trademark of Nepera Chemical Co., Inc., for its brand of methenamine mandelate.

1. Wilhelm, S. F.; et al.: J.A.M.A. 141: 837 (1949).

2. Scudi, J. V., and Duca, C. J.: J. Urol. 61: 459 (1949).

3. Butt A. J.: J. Florida M. A. 35: 430 (1949).

NEPERA CHEMICAL CO., INC.

Pharmaceutical Manufacturers

NEPERA PARK • YONKERS 2, N.Y.

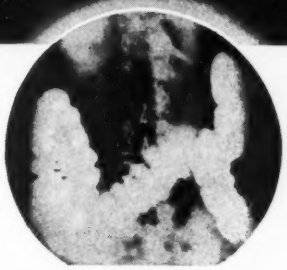
A New, Distinctive Synthetic ANTISPASMODIC

TROCINATE

HIGHLY POTENT . . . NON-TOXIC

DUAL ACTIVITY

X-ray, typical spastic gut



X-Ray, typical normal gut

THE THIOL LINKAGE, **chemically incorporated for the first time in a synthetic antispasmodic drug, is responsible for the extremely high potency of Trocinate.**

TROCINATE (Beta-diethylaminoethyl-diphenylthioacetate hydrochloride) offers in a single molecule *all* the advantages and *none* of the disadvantages of atropine and papaverine. Note these outstanding properties:

1. ***Strong musculotropic action***
2. ***Strong neurotropic action***
3. ***Non-narcotic***
4. ***Remarkably free from side-effects, low in toxicity***

Professional samples are available. Write Wm. P. Poythress and Company, Incorporated, Richmond 17, Va.

INDICATIONS: For the relief of smooth muscle spasm; as existing in pylorospasm, gastric hyperacidity, gastric or duodenal ulcer, gastritis, enteritis, colitis, irritable colon, biliary colic, biliary dyskinesia.

DOSAGE: Adults—one or two tablets, three or four times a day. (Swallow whole to avoid local anesthetic effect).

SUPPLIED: Trocinate (pink sugar-coated tablets) contains 100 mg. Trocinate.

Trocinate with phenobarbital (red sugar-coated tablets) contains 65 mg. Trocinate and 15 mg. phenobarbital. Available in bottles of 40 and 250 tablets.

POYTHRESS *Trocinate* **Beta-diethylaminoethyl-diphenylthioacetate hydrochloride**

In Acute Follicular Tonsillitis...

"Aspergum
every 3 hours
for sore throat..."*

DILLARD'S

Aspergum

SALIVARY ANALGESIA

—provides 3½ grains acetylsalicylic acid in each pleasantly flavored chewing gum base tablet. Particularly suitable for administering aspirin to children and to patients who have difficulty swallowing tablets.

*Rehfuss, M. E., Albrecht, F. K., and Price, A. H.: A Course in Practical Therapeutics, Baltimore, The Williams & Wilkins Co., 1948, p. 371.

•

WHITE LABORATORIES, INC., Pharmaceutical Manufacturers, Newark 7, N.J.

new and different salt substitute

...tastes like salt
looks like salt
sprinkles like salt

co-salt

congestive heart failure

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hypertension

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CO-SALT tastes so much like table salt that low sodium diet patients can actually enjoy their food again. With CO-SALT in place of sodium chloride, they will cooperate more fully in following your diet...will be better nourished...and intake of edema-causing sodium will be held to a minimum.

CO-SALT CONTAINS NO LITHIUM . . . is not bitter, metallic, or disagreeable in taste. It is the only salt substitute that contains choline.

CO-SALT — for use at the table or in cooking—will be a joy to low-sodium diet patients.

INGREDIENTS: Choline, potassium chloride, ammonium chloride and tri-calcium phosphate.

Professional Samples Upon Request

Available:
2 oz. shaker top package
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Accepted for advertising in the Journal of the American Medical Association.

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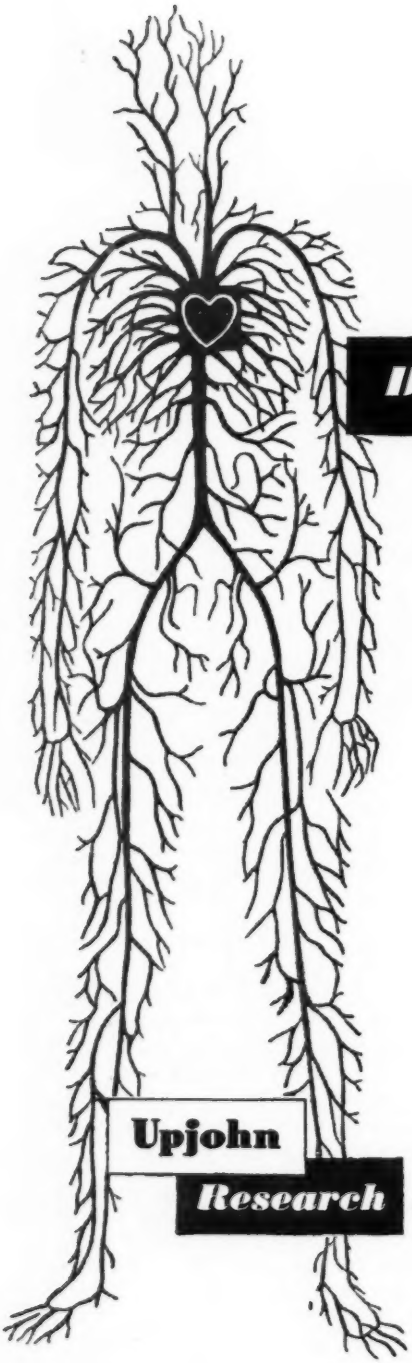

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price reduction of 26%

A price reduction of 26% makes it possible now for more patients to receive the therapeutic advantages of Depo*-Heparin.

Upjohn research and production workers have so improved methods of extraction, purification, and assay of this long-acting anticoagulant that it is now possible to meet increasing clinical needs and *to reduce its cost by 26%*.

Literature describing anticoagulant therapy in detail is available on request.

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Research ***in the service of the profession of medicine***

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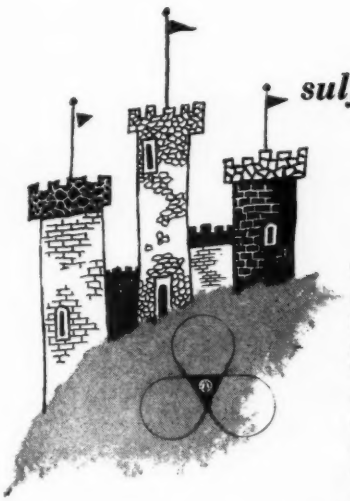


sulfonamide therapy at its safest

The greater safety of sulfonamide mixtures over single sulfonamides has been fully established. Among preparations available to the physician, TRICOMBISUL* is unique, being composed of sulfadiazine and sulfamerazine (which deserve first and second place) and sulfacetimide which is the "most advantageous for third place."[1]

TRICOMBISUL

(a combination of sulfa*cetimide*, sulfadiazine and sulfamerazine)

Not only does TRICOMBISUL reduce the hazard of renal concrement formation almost to the vanishing point, but it also diminishes the likelihood of allergic reactions.[2]

DOSAGE: In major infections an initial dose of 3-4 Gm. followed by 1 Gm. every four or six hours. In less severe infections, 1 Gm. four times daily.

TRICOMBISUL is available in 0.5 Gm. tablets, each containing 0.166 Gm. of sulfa*cetimide*, sulfadiazine and sulfamerazine. In bottles of 100 and 1000 tablets.

1. Lehr, D.: Scientific Exhibit, Atlantic City Session, American Medical Association, June 6-10, 1949.
2. Lehr, D.: Brit. M. J. 2:543, 1948.

*T. M.

Schering CORPORATION • BLOOMFIELD, NEW JERSEY

TRICOMBISUL

SCHERING

"One nervous woman

can give rise
to more diverse,
undiagnosed and
undiagnosable
complaints
than a whole
pathological ward."

Harding, T.S.: M. Rec. 160:198, 1947

For the many patients, especially women, who complain of nervous tension throughout the day and wakefulness during the night, ESKAPHEN B ELIXIR is an ideal preparation.

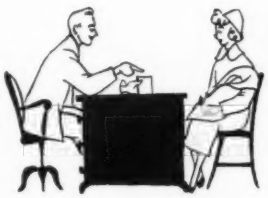
ESKAPHEN B ELIXIR provides both the calming action of phenobarbital (¼ gr. per 5 cc.) and the tone-restoring effect of thiamine (5 mg. per 5 cc.).

Eskaphen B Elixir

The delightfully palatable combination of phenobarbital and thiamine.

Smith, Kline & French Laboratories, Philadelphia

simplicity, itself



to prescribe **SIMILAC**

simply add one measure of Similac to two ounces of water to yield two ounces of normal formula of 20 cals/oz

simplicity, itself

to prepare **SIMILAC**

simply instruct mother to float the prescribed quantity of Similac on previously boiled water and stir

simplicity, itself

to digest **SIMILAC**

for { the proteins have been so modified / the fats so altered / the minerals so adjusted

that there is no closer equivalent to human breast milk than

SIMILAC

for term and premature infants throughout the first year of life whenever breast feeding must be supplemented or replaced. Similac has the same zero curd tension as human breast milk.

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The Picture Framed in the Minds of Physicians

Comprise the entire properties of the leaf of Digitalis

Physiologically Standardized

Therefore always Dependable

Each Pill is equivalent to one U.S.P. Digitalis Unit

Clinical samples sent to physicians on request

Davies, Rose & Company, Limited
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D22

maintain edema-free state

Only one or two tablets daily—plus an occasional injection—are needed to maintain the cardiac patient at "dry weight" employing Tablets MERCUHYDRIN® with Ascorbic Acid. Some patients—freed of accumulated fluid with parenteral meralluride sodium—may be kept edema-free on tablets alone.

Tablets MERCUHYDRIN with Ascorbic Acid permit daily fluid control with a minimum of injections facilitating the frequent-dosage schedule of modern diuretic therapy.

ideal for ambulant patients and those who cannot be given frequent injections.

well tolerated when prescribed in the recommended dosage.

effective in producing mild, sustained diuretic action.

convenient—the oral is the safest and most convenient route.

Keep your cardiac patients edema-free with . . .

Tablets

MERCUHYDRIN®

WITH ASCORBIC ACID

dosage: One to two tablets daily—morning or evening—preferably after meals.

available: Bottles of 100. Each tablet contains meralluride 60 mg. and ascorbic acid 100 mg.

Lakeside Laboratories, INC., MILWAUKEE 1, WISCONSIN

'B'

major

"Beminal" offers major 'B' therapy with a quintet of distinctive combinations that simplify selection of appropriate treatment for each patient.

1. ***"Beminal"*** Forte with Vitamin C (Capsules No. 817) is recommended whenever oral administration of massive doses of B factors and vitamin C is desirable. Each capsule contains:

Thiamine HCl (B_1)	25.0 mg.
Riboflavin (B_2)	12.5 mg.
Nicotinamide	100.0 mg.
Pyridoxine HCl (B_6)	1.0 mg.
Calc. pantothenate	10.0 mg.
Vitamin C (ascorbic acid)	100.0 mg.

Dosage: One to three capsules daily or as directed by the physician.

The other members of the "Beminal" family are:

2. ***"Beminal"*** fortified with Iron and Liver, Capsules No. 816.

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5. ***"Beminal"*** Tablets No. 815.

Ayerst, McKenna & Harrison Limited

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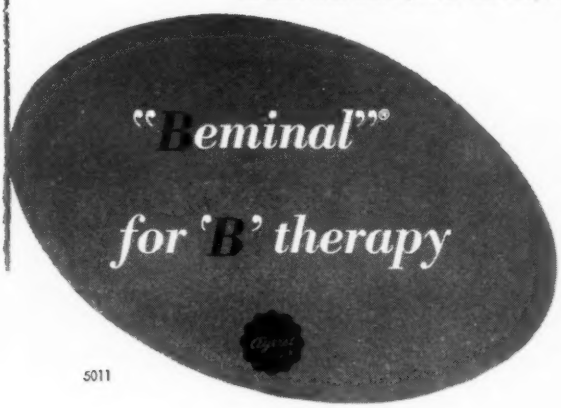

5011

"just a few pounds" **overweight**

How wrong the patient is who shrugs off "a few pounds" of overweight as something of little consequence! As every physician knows, those "few pounds" overweight may put that patient "a few feet underground" before his time.

Weight reduction—of even a few pounds—is often the surest means of lengthening life and diminishing future illnesses.

Smith, Kline & French Laboratories, Philadelphia

Dexedrine* Sulfate

A most effective drug for control of appetite in weight reduction

tablets

elixir

*T.M. Reg. U.S. Pat. Off. for dextro-amphetamine sulfate, S.K.F.

Cremothalidine is a smooth, exceptionally palatable suspension of *Sulfathalidine*® phthalylsulfathiazole, a remarkably effective, nontoxic enteric bacteriostat, only 5% of which is absorbed from the bowel. *Cremothalidine* is particularly acceptable to children, but is useful in all age groups. It is indicated especially for ulcerative colitis, *E. coli* infections of the urinary tract, and for enteric bacteriostasis in intra-abdominal surgery. *Cremothalidine* is supplied in convenient, wide-mouth *Spasaver*® bottles of 8 fluidounces.
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Cremothalidine®

Sulfathalidine Suspension

Simplified dosage . . . superior Sulfonamide

B^{12} *Activity——orally*

Blood-building activity
Appetite activity

NOW.....B^{12} *activity—in a blood*

Iron in tonic quantities!

B Complex Vitamins well in excess of known minimum daily requirements!

Pleasant tasting, too!

B^{12} activity of at least 12 micrograms of vitamin B^{12} per oz. as determined by microbiological assay

IRON-B COMPLEX with B^{12} Activity

blood*ilding, appetite-building iron tonic!*

Blood-Building Activity

Positive hematinic response is assured by the tonic quantities of ferrous gluconate, plus the important activity of vitamin B_{12}.

Each ounce of Beta-Concemin, Ferrated provides 230 mg. of elemental iron. Ferrous gluconate is more efficient, because it is soluble through the entire pH range of the gastro-intestinal tract. Clinical reports[1,2] show it is better tolerated than other iron preparations. Virtually free from gastric irritation—"does not precipitate gastric proteins nor liberate strong acids by hydrolysis."[3]

BETA-CONCEMIN Ferrated

Appetite-Building Activity

Vitamin B_{12} activity appears to be the most important hematopoietic activity in liver. This B_{12} activity is combined with the B complex factors known to be important in cellular metabolism and growth, and in *rebuilding the appetite.*

Each ounce of Beta-Concemin, Ferrated supplies the activity of 12 mcgm. of vitamin B_{12} as contributed by 4 Gm. special fraction derived from liver.

1. Rezinkoff, P.: Med. Clin. N. Amer. 28: 368, 1944.
2. Teeter, E. J.: J.A.M.A. 127: 976, 1945.
3. Haden, R.L.: Principles of Hematology, Lea & Febiger, Philadelphia, 1940.

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DEPARTMENT A
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Pleasant-tasting

BETA-CONCEMIN Ferrated

provides Iron . . . B complex . . . B_{12} activity

Better appetite . . . better hematinic response in hypochromic-microcytic anemias like these

NUTRITIONAL DEFICIENCY

Gastrointestinal disorders . . . diarrhea and vomiting; partial obstruction, biliary and pancreatic disease

Alcoholism

Food fads

Debilitated nutritional states associated with malignancy, starvation and hyper-pyrexia

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Hookworm disease

Menometrorrhagia

Hematuria

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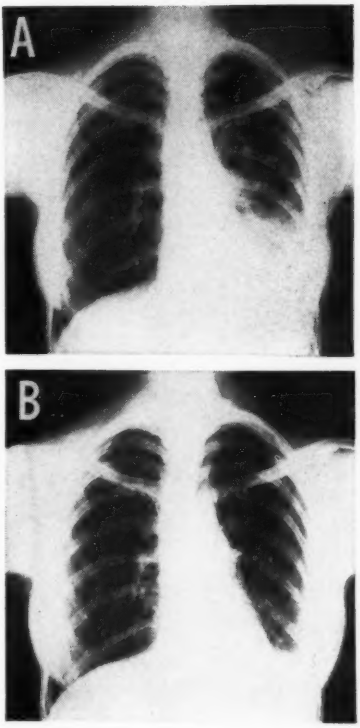
Merrell
1828
CINCINNATI • U. S. A.

Effective Chemotherapy in TUBERCULOSIS

Dihydrostreptomycin, or Streptomycin, used alone or in combination with para-aminosalicylic acid, is recognized as a valuable and, in some instances, an essential adjuvant in the treatment of selected types and stages of tuberculosis.

Para-aminosalicylic acid is capable of inhibiting or significantly delaying the emergence of bacterial resistance to streptomycin or dihydrostreptomycin.

These drugs are not to be regarded as substitutes for traditional therapeutic methods. Rather, they serve best when properly integrated with bed rest and, where necessary, collapse measures or other forms of surgery.



A. Before Treatment *(9 days prior to Dihydrostreptomycin therapy) Diffuse lobular tuberculous pneumonia, lower half of left lung; thin-walled cavity above hilus (3 x 3.5 cm.).*

B. After 3 Mos. Treatment *(2 days after discontinuance of Dihydrostreptomycin) Considerable clearing of acute exudative process in the diseased lung; cavity smaller and wall thinner.*

Detailed literature on the subject of chemotherapy in tuberculosis will be supplied upon request.

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Merck Antitubercular Agents

Streptomycin Calcium Chloride Complex Merck

Para-Aminosalicylic Acid Merck (PAS)

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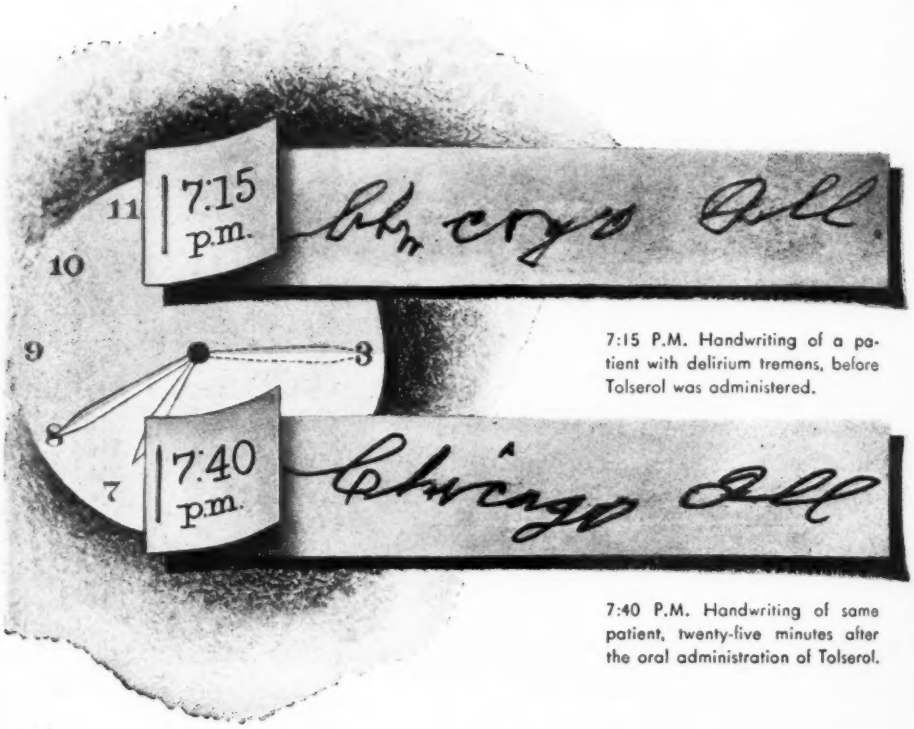
in alcoholism...



7:15 P.M. Handwriting of a patient with delirium tremens, before Tolserol was administered.

7:40 P.M. Handwriting of same patient, twenty-five minutes after the oral administration of Tolserol.

Tolserol

***Squibb Mephenesin** (3-o-toloxy, 1-2-propanediol)*

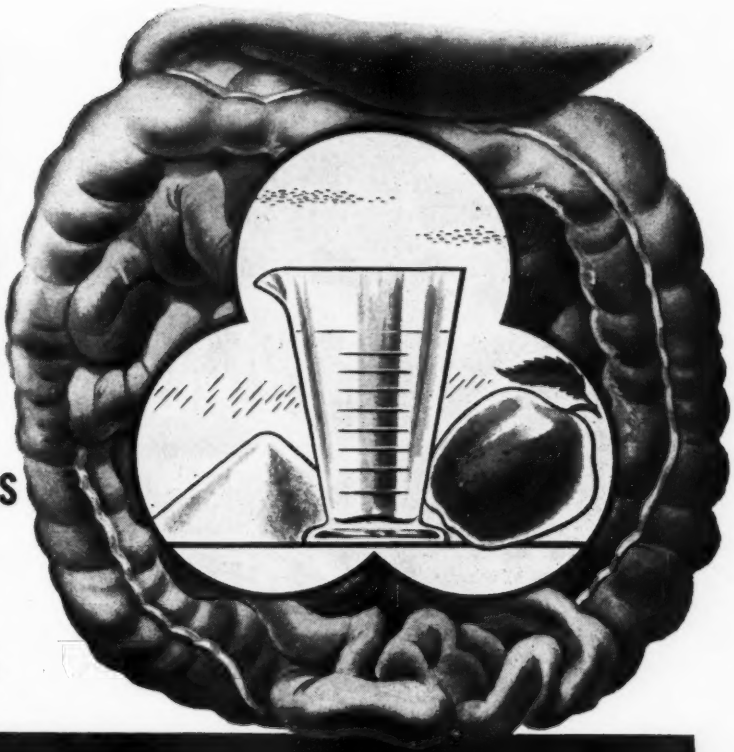
- to control tremor and quiet the patient
- for the relief of withdrawal symptoms
- to reduce or eliminate the use of paraldehyde and barbiturates
- administered orally and intravenously

Elixir, Capsules, Tablets, Solution

"TOLSEROL" IS A TRADEMARK OF E. R. SQUIBB & SONS

SQUIBB

3 reasons why



relief is prompt in diarrheas

Wyeth

- **KAOLIN**—recognized for centuries as a most effective adsorbent and demulcent;
- **AUGMENTED BY A SPECIAL ALUMINA GEL**—ideal as a base and providing outstanding added protective, soothing, and adsorptive properties;
- **WITH PECTIN**—contributing bland bulk in addition to its soothing, local colloid action. Pleasant-tasting, easy to take

KAOMAGMA®
WITH PECTIN

provides the benefits of three clinically established coacting agents; quickly restores the patient's comfort.

Bottles of 12 fl. oz.

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Wyeth®

newly recognized palatable source of

POTASSIUM

. . . the neglected mineral

Appreciation of potassium-depleted states is comparatively new. The importance of a normal potassium-ion balance in the body is often overlooked.

Maintenance of the electrolyte balance, osmotic pressure of the body fluids and normal cardiac rhythm and rate is impossible when the total of potassium-ions is below a critical level.

A common avenue of potassium-ion loss is through increased urinary excretion during fever.

Valentine's Meat Extract, with its high content of soluble potassium salts (equivalent to 74-97 mg. KCl per cc.) together with other inorganic salts, meat bases and small amounts of soluble proteins is a valuable dietary supplement, furnishing practical amounts of potassium in palatable form. Valentine's Meat-Juice Co., Richmond, Va.

References . . .

J. Clin. Endocrin. 9,691 (1949).

Trans. of Conference on Metabolic Aspect of Convalescence, 17th Meeting, Josiah Macy, Jr. Foundation, New York, Mar. 29-30, 1948.

Valentine's
PREPARATION
MEAT EXTRACT

Potent ORAL PENICILLIN for All Age Groups

White's **drop-cillin** —a truly palatable liquid for drop-dosage to infants and small children—administered direct from the dropper or added to the first ounce or two of formula or other liquid—no tablets to crush, in suitable cases no unwanted injections—

50,000 UNITS* IN ONE DROPPERFUL

White's **dram-cillin** —for children and adults—the pleasant palatability which assures round-the-clock dosage—high potency in convenient dosage:

100,000 UNITS* IN A TEASPOONFUL

SUPPLIED

DROP-CILLIN—Supplied in 9 cc. "drop-dosage" bottles containing 600,000 units of penicillin. Solution is pink in color. Accompanying calibrated dropper (filled to mark) delivers approximately 20 drops (0.75 cc.) containing 50,000 units of penicillin.*

DRAM-CILLIN—in 60 cc. "teaspoonful-dosage" bottles containing 1,200,000 units of penicillin. Solution is ruby-red in color. Each teaspoonful (approximately 5 cc.) provides 100,000 units of penicillin.*

*(*buffered penicillin G potassium*)

Supplied to the pharmacist as a dry white crystalline powder. Dispensed freshly prepared, these delicious vanilla-flavored solutions will retain full stated penicillin potency for seven days when refrigerated.

WHITE LABORATORIES, Inc., Pharmaceutical Manufacturers, Newark 7, New Jersey

FEOSOL ELIXIR IS SO PALATABLE AND RESTORES HEMOGLOBIN SO RAPIDLY THAT IT IS THE STANDARD LIQUID IRON FOR CHILDREN AND

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2 TEASPOONFULS OF FEOSOL ELIXIR PROVIDE THE SAME AMOUNT OF FERROUS SULFATE (5 GRAINS) AS ONE FEOSOL TABLET.

FEOSOL ELIXIR IS A PRODUCT OF
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Digestive Trouble-Shooter with "peptomatic" action*

Faced with complex digestive disturbances so frequently therapy-elusive, more and more physicians are utilizing Entozyme's highly effective triple-enzyme digestional aid in small-tablet form. Actually, a "tablet-within-a-tablet" (containing pancreatin, pepsin and bile salts), the secret of Entozyme's success lies in its unique "peptomatic" action*, which selectively deposits each digestive ferment at its proper gastro-intestinal level, in its optimal state of enzymatic activity. Entozyme's value has been well established clinically [1,2,3] in such conditions as chronic cholecystitis, chronic duodenal ulcer, acute and chronic pancreatitis and certain postoperative syndromes of the gastro-intestinal tract, as well as for the relief of functional disturbances such as nausea, pyrosis, belching, and flatulence.

*A coined word to describe the unique action of the Entozyme Tablet which releases pepsin only in the stomach, and pancreatin and bile salts only in the small intestine.

A. H. ROBINS CO., INC., RICHMOND 20, VA.
Ethical Pharmaceuticals of Merit since 1878

Outer shell water- and acid-soluble; inner core enteric protected.

Actually a tablet-within-a-tablet

Pepsin in outer shell released in stomach

Pancreatin and bile salts in inner core released in intestine

Formula: Each specially constructed tablet contains Pancreatin, U.S.P., 300 mg.; Pepsin, N.F., 250 mg.; Bile Salts, 150 mg.

Dosage: One or two tablets after each meal, or as directed by physician, without crushing or chewing.

Supplied: Bottles of 25 and 100.

References: 1. Kammandel, N. et al.: Bull. New York Med. Coll., Flower & Fifth Ave. Hosps., (in press). 2. McGavack, T. H. and Klotz, S. D.: Bull. Flower & Fifth Ave. Hosp., 9:61, 1946. 3. Weissberg, J., McGavack, T. H. and Boyd, Linn J.: Am. Dig. Dis., 15:332, 1948.

Entozyme®

for comprehensive digestional aid in tablet form

Robins

real

PALATABILITY

Orange flavor tastes delicious straight on the tongue or mixed in food. Non-allergenic, non-alcoholic Vitamin A ester used—no fishy taste or odor. No alcohol.

real

POTENCY *and* STABILITY

Each cc. of Ol-Vitum Drops contains:

Vitamin A ester	10,000 USP Units
Vitamin D	2,000 USP Units
Natural mixed tocopherols*	3 mg.
Thiamine hydrochloride	3 mg.
Riboflavin	0.8 mg.
Niacinamide	15 mg.
Pyridoxine hydrochloride	1.6 mg.
Ascorbic acid	100 mg.

No refrigeration necessary. No expiration dating required.

real

EFFECTIVENESS

Infants receiving Vitamins A, C and D plus the B complex showed weight increases 20% to 50% greater than those receiving Vitamins A, D and C alone.[1]

In Bottles of 15 and 30 cc. with especially calibrated dropper. Dosage: ¼ to 1 cc. according to age.

OL-VITUM®
DROPS

WATER-SOLUBLE

I.V.C.®

OL-VITUM® CAPSULES are also available

International Vitamin Division **IVES-CAMERON COMPANY, INC.,** New York 16, N. Y.

1. Kasdon, S. C., and Cornell, E. L.: Am. J. Obstet. & Gynec. 56:853 (Nov.) 1948.

*Equivalent (by biological assay) to 1.5 mg. d, Alpha Tocopherol

a valuable aid

in postsurgical recovery

A large percentage of patients enter surgery at a low plasma protein level, and the operative procedure makes further inroads on the already depleted protein reserves.[1,2] A lowered protein level is unfavorable to recovery. It predisposes the patient to pulmonary edema and infection, retarded wound and fracture healing and impaired liver function.[3,4] A high protein level is conducive to rapid healing.[5]

Since diets immediately following surgery are usually inadequate, protein digests given intravenously result in improved strength, appetite, and wound healing. Consequently, they greatly accelerate recovery.[6,7]

2000 cc. of TRAVAMIN 5% a day will satisfy the protein requirements of a high percentage of surgical patients. 2000 to 4000 cc. a day are given according to requirements.[8] TRAVAMIN is made from bovine plasma.

TRAVAMIN 5% IN WATER
TRAVAMIN 5%, DEXTROSE 5% IN WATER

bibliography

1. WHITE, C. S.: "Intravenous Fluids with Particular Reference to Amino Acids," M. Ann. District of Columbia, 15:251 (June) 1946

2. MEYER, J. A., KOZOLL, D. D.: "Protein Deficiency in Surgical Patients," Surg., Gyn. & Obst., 78:181 (February) 1944

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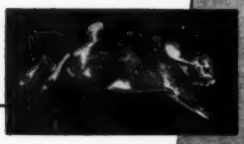

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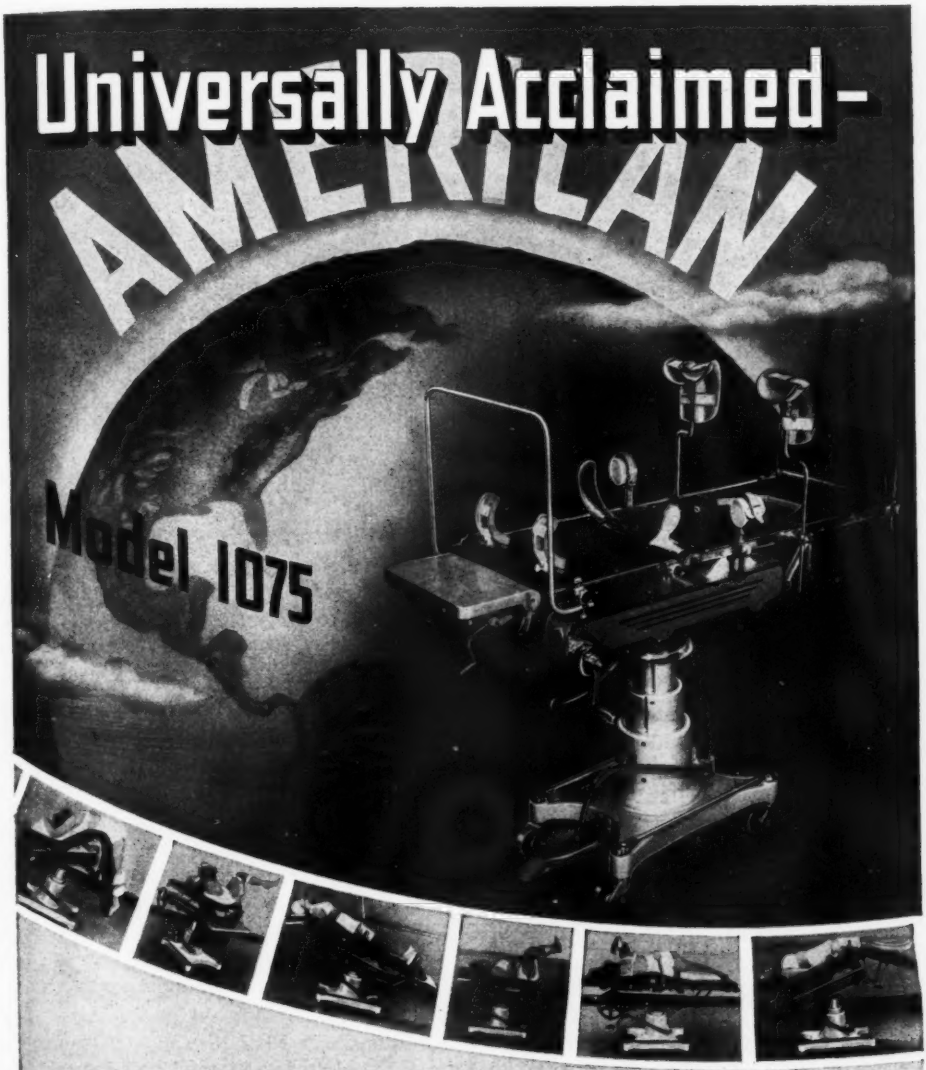

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* Patent applied for.

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CURARE AS AN ADJUNCT IN THE CONDUCT OF LABOR*

A PRELIMINARY REPORT ON ITS USE IN 200 CASES

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and
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Curare is reported to have been used first by the South American Indians as a paralyzing poison. Its original investigation was carried out by Claude Bernard. The first reports of its use in man during anesthesia were by Griffith[1] and Johnson. Subsequent reports by Griffith were important in establishment of curare as a reliable aid in anesthesia.

When curare is administered parenterally to man in a single large dose or in small repeated doses there is a regular sequence in which the signs of complete curarization occur.[2] First the muscles of the eyelid and eyeball are affected resulting in a sensation of heaviness, followed by ptosis, nystagmus, and diplopia. Next the facial muscles lose activity and then the muscles of the neck and throat are affected with resulting head drop and difficulty in speech. Function of the muscles of the trunk, perineum, and extremities is depressed and finally the muscles of the diaphragm are paralyzed.

In doses which leave vital functions unimpaired curare is able to produce a graduated and temporary block of nerve impulse to the myoneural junction of voluntary muscle. The specific action is the diminution of the effect of nerve stimuli on voluntary muscle which is thought to be brought about by an increase in the threshold of the muscle for acetylcholine.

To the present time the principal clinical use has been as an adjunct to anesthesia. It has also been used to control spastic or convulsive states and as an aid in the diagnosis of myasthenia gravis. The interest for its use in obstetrics arises from that property of curare which produces relaxation of voluntary and semi-voluntary musculature.

Reports on the use of curare in obstetrics appeared in 1948 and 1949 by Laborit[3,4] *et alii* of France. These articles described relaxation and analgesia obtained in 150 deliveries using the intramuscular route for administration. Our investigation was instituted to attempt to verify the results reported and to determine the methods of administration, the dosage and results obtained from a larger series. This was done in order to consider the possible acceptance of its use in labor.

The possibilities are as follows:

(1) If relaxation of the muscular tone of the soft parts could be obtained the effort required for delivery would be less for the mother and in like manner if the resistance could be reduced to the passenger the possibility of injury would be decreased.

(2) If a safe drug is available which will reduce perineal muscular tone it is likely to cause a reduction of the pain which accompanies forcible distention of muscular elements, thereby reducing the amount of analgesic or anesthetic necessary for relief of pain. It also follows that the relaxation of soft parts which is desirable in surgical or operative procedures might be obtained without subjecting the patients to deeper planes of surgical anesthesia.

(3) The substance used should not interfere with the normal processes of labor and delivery and must not be injurious to the baby.

Curare was used in 200 unselected cases for delivery at City Hospital and in private practice. The method of choice for administration was determined to be by the intravenous route. This route was considered more desirable because:

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*From the Department of Obstetrics and Gynecology and the Department of Anesthesiology, St. Louis University School of Medicine.

*The author wishes to acknowledge the cooperation of Unit 1 (Washington University School of Medicine) and Unit 3 which supplied obstetric cases for this investigation. The valuable assistance and untiring efforts of Chief Resident J. C. Crouse, Residents M. P. Lawler, A. F. Forster, S. DiLeo, B. Abrams, B. Travis, Senior Intern V. Kondanellis and Junior Intern K. Smith is hereby acknowledged. If they represent a cross section of the young medical profession of today the future of medicine is safe in their capable hands.

(1) The effect was almost immediate and did not depend upon an indefinite rate of absorption into the blood stream.

(2) There would be less chance of an accumulative effect. The drug chosen for investigation was "intocostrin" and "metubine iodide" (1 mg. per cc.) and the results were about the same with each. Its use during the first stage of labor was investigated, but not completely, and it was abandoned as probably non-effective. However, during the second stage of labor it appeared to be of value.

Technic of Administration and Clinical Response.—With the onset of the second stage of labor, with the membranes ruptured 20 units of "intocostrin" or 1 cc. of "metubine iodide" was given intravenously. The response to the medication was noted by the relaxation of the perineum and was gauged clinically by the relaxation of the anal sphincter. The response was noted in about 40 seconds and was evidenced by the ability to dilate the anal sphincter widely without pain. Two or three fingers could be inserted through the anal orifice in this manner. If additional medication was desirable it was found safe to administer an additional 0.5 cc. (10 units of "intocostrin" or 0.5 cc. "metubine iodide") with no undesirable side effects provided it was given two to three minutes after the initial dosage.

The perineal musculature has the same embryonic muscular origin as the anal sphincter. It is innervated by the same nerve supply and enters into the sphincter action. It may be assumed that the response is therefore identical. This has been our clinical observation. Because of technical difficulties encountered in the determination of the relaxation of the vaginal orifice the anal sphincter was chosen for investigation. In like manner the relaxation of the levator muscles may be observed clinically, but so far we have found no way that this can be proved scientifically.

CLINICAL OBSERVATIONS

Perineal Relaxation.—This was determined to be present satisfactorily in 91 per cent of the cases. It was questionable in 7.5 per cent and absent in 1.5 per cent. The effect was less pronounced in primiparas. This may be explained by the consideration that much of the perineal support in primiparas women is derived from connective tissue elements (fascia, elastic tissue, and so on) which are not affected by curare. During delivery of the first offspring this tissue is greatly distended or broken and apparently does not return to its original state. It appears, therefore, that multiparous women depend upon the muscular tissue for support to a greater extent. This has been our clinical observation.

The loss of tone in the muscular portion of the perineum was evident only after distention. The resistance to distention was decreased and when once distention occurred, relaxation or loss of tone remained until the effect of curare subsided, usually from 45 to 90 minutes. During descent of the presenting part, which may occur rapidly, care is necessary to prevent overdistention and rapid expulsion through the perineum and in order to decrease the possibility of fascial tears.

Analgesic Effect.—Since the perception of pain is subjective the information as to the analgesic effect was obtained from the patient. The deliveries in this series were spontaneous in 79 per cent of the cases and without general or spinal anesthesia in 86.5 per cent. For this reason we feel justified in accepting the patient's evaluation on this point. Of those patients who received no anesthesia the response was affirmative in 159, negative in 27, and in the others the response was indifferent.

The analgesic effect may be due to one or both of two factors. First it may be due to some "blocking" effect of curare on afferent sensory fibers. We have observed a constant diminution or absence, in many cases, of the "bearing down" reflex as the presenting part reaches the pelvic floor. In like manner the respiratory stimulating effect of anal dilatation is either reduced or absent. Secondly, it may be due to the reduction of resistance to forceful distention.

No change was evident in the perception of cutaneous nerve stimulation. In like manner there seemed to be little or no change in the pain produced by uterine contractions.

Effect on the Forces of Labor, Uterine Contractions.—We did not observe the increased rate of rhythmic contractions as reported by Laborit except in an occasional case. There was no change in 174 of our cases. There was a decreased interval in 15 cases, 6 of which had a somewhat increased intensity. In an additional 16 cases the intensity was thought to be increased. This would be in accordance with the observations of Harroun and Fischer.[5] The length of the second stage varied for primiparas from 6 minutes to 158 minutes in spontaneous deliveries with an average of 48.6 minutes in 22 cases. There were 136 spontaneous deliveries among the multiparous group. The shortest duration of the

second stage was 2 minutes, the longest 98 minutes with an average of 16.2 minutes.

Abdominal Muscles.—In every instance of spontaneous delivery the patients were able to use their abdominal muscles effectively. In breech extraction and low forceps deliveries this was also true when no general anesthetic was utilized. With the loss of the bearing down reflex or its diminution it was necessary to instruct the patient as to the use of these muscles in many instances.

Effect on the Third Stage of Labor.—With no marked effect noted upon the uterine contractions it would logically follow that the third stage would be uncomplicated. This was our observation and since little or no anesthetic was used and minimal trauma encountered no cases of uterine atony were observed. The length of the third stage varied from 1 minute to 45 minutes (manual removal in one case) with an average of 3.8 minutes. The blood loss was minimal in 98 per cent of the cases, moderate in 1 per cent, and 1 per cent of the cases showed a loss of 500 cc. (manual removal of

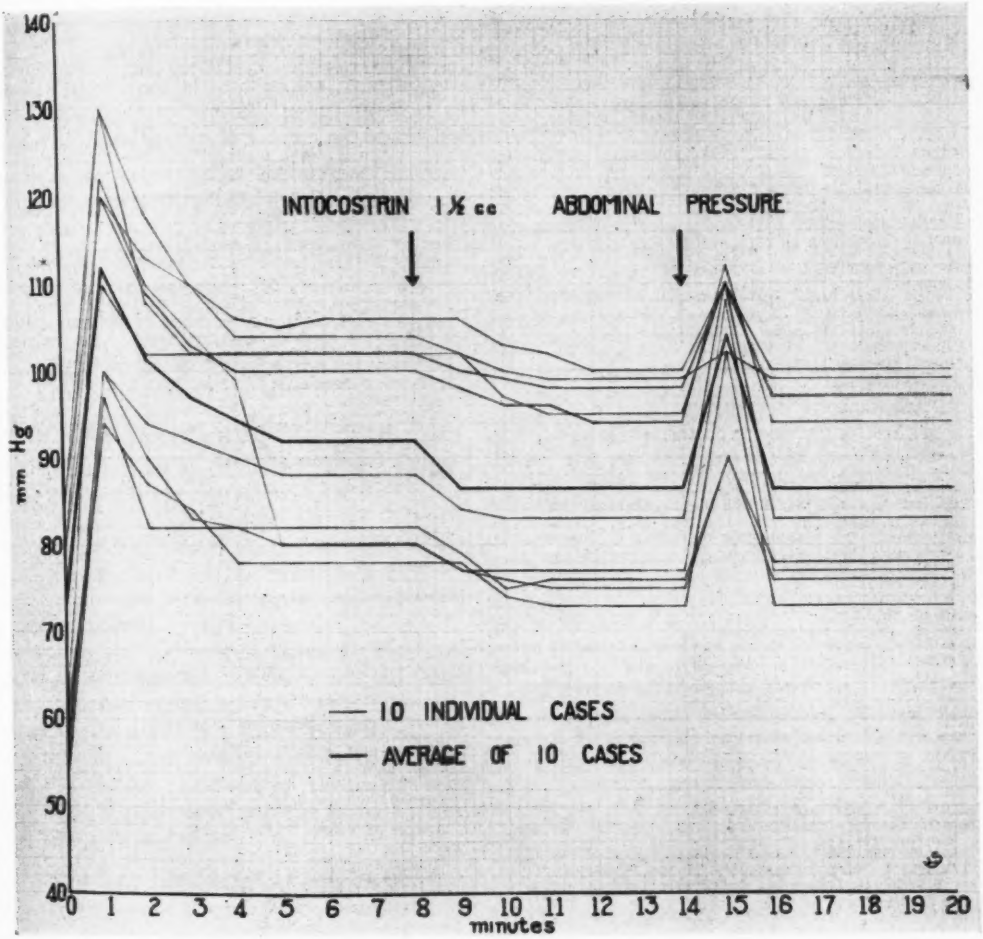

Fig. 1

Response to "intocostrin." Ten patients were selected near term. A perineometer, attached to a regular mercury manometer, was tested for maintenance of pressure and it was then inserted through the anal sphincter with a given pressure from 50 to 85 mm. of mercury. The initial rise of pressure represented the resistance or tone of the anal sphincter. This pressure gradually fell off to a point where it became stabilized. This fall of pressure represents the normal gradient of relaxation for that given tension. When the pressure became stabilized for a period of five to ten minutes "intocostrin" (30 units) was given intravenously. Within a few seconds there was an additional relaxation noted in all 10 cases varying from 4 to 8 mm. of mercury, with an average of approximately 5.5 mm. We presume this fall in pressure is the effect of curare. When this new plane of relaxation was reached the patient was instructed to bear down. In each instance there was an additional rise in pressure within the perineometer which we believe demonstrated the ability of the patient to utilize the abdominal muscles.

placenta). In our series there was no instance of delayed postpartum hemorrhage.

The use of "ergonovine" was at the operator's discretion and its effect was observed as usual. In the first 50 cases no oxytoxic was used until after the placenta was delivered. We believe the bleeding was a little more in these cases. In like manner no change was observed in the effect of pituitary extract although opportunities to observe this were minimal.

Effect on the Newborn.—In this series 99 per cent were born alive. Two cases were given curare for delivery who had absent fetal heart tones on admission. Spontaneous and immediate cry and respiration were observed in 97.5 per cent of the cases and in 1.5 per cent slightly delayed but did not require resuscitation. One baby was delivered with thrombocytopenic purpura and massive intercranial hemorrhage which required resuscitation. In no instance was there evidence of effect of curare upon the babies including 15 prematures. This is in accordance with the findings of Harroun and Fischer.[5] Whether this is due to some placental barrier or to the rapidity with which the mother's myoneurogenic system depletes the curare level in the blood stream we are unable to say.

CURARE IN 200 DELIVERIES

Primipara 45
Multipara 155
Duration of Pregnancy
  Term 185
  Premature 15 (all lived)
Amount of Curare Used
  109 received 1 cc.
  88 received 1.5 cc.
  3 received 2 cc.
Anesthesia (general or spinal)
  173 no anesthesia
  24 nitrous oxide and oxygen
  3 saddle block with subsiding effect
No change noted in
  (1) Blood pressure
  (2) Pulse
  (3) Respiration
  (4) Heart tones
Average age 26.5 years
  Youngest 11
  Oldest 45
Stillbirths 2
  Both patients entered hospital with absent heart tones
Predelivery Medication
  175 "Demerol" and "scopolamine"
  13 "Demerol" and "seconal"
  2 "Demerol" and atropine sulfate
  2 Atropine sulfate
  8 No medication
Undesirable Side Effects
  2 patients complained of strabismus
  1 patient also complained of some respiratory distress which was not evident

Table 1

CURARE IN 200 DELIVERIES

Condition of babies at birth (2 stillbirths)
  Spontaneous cry and respiration
    Immediate 194
    Delayed (slightly) 3 (did not require respiration)
    Delayed 1 (thrombocytopenic purpura with hemorrhage required resuscitation and expired after 8 hours)
Uterine Contractions
  174 No change
  15 Decreased interval (6 also had intensity increased)
  11 Increased interval (slight)
  12 Increased intensity (6 also had decreased interval)
Presentation
  Cephalic 181
  Breech 16
  Face 2
  Transverse 1

Table 2

COMMENT

From this series it appears that curare fulfills the requirements enumerated in the original concept of this investigation. In my own experience it has increased the number of spontaneous deliveries, and

CURARE IN 200 DELIVERIES

Duration of second stage (spontaneous deliveries)
  Primipara 22
    Longest 158 minutes
    Shortest 6 minutes
    Average 48.6 minutes
  Multipara 136 (in 14 cases no time was recorded for second stage)
    Longest 98 minutes
    Shortest 2 minutes
    Average 16.2 minutes
Episiotomy performed
  Multipara 25
  Primipara 34
    (1° procaine infiltration along lines of episiotomy in patients who received no general or spinal anesthetic)
Laceration encountered (all cases)
  Multipara
    1° 18
    2° 6
    3° 0
  Primipara
    1° 3
    2° 0
    3° 0

Table 3

CURARE IN 200 DELIVERIES

Perineal relaxation (determined by operator)
  Present 182
  Not present 3
  Questionable 15
Time of onset
  Longest 2 minutes
  Shortest 25 seconds
  Average 38 seconds
Blood Loss
  Minimal 196
  Moderate 2
  Postpartum hemorrhage 2 (500 cc.)
    (Both required manual removal of placenta)
Analgesic effect (subjective)
  Yes 159
  No 12
  (The remainder were either indifferent in response or received anesthesia)
Third Stage of Labor
  Shortest 1 minute
  Longest 45 minutes (manual removal)
  Average 3.8 minutes

Table 4

reduced the amount of anesthetic necessary to procure analgesia and relaxation. It has proved to be a valuable adjunct in operative obstetrics both in reducing the anesthetic requirements and the amount of force necessary for such operations. It did not interfere with the normal forces of labor and it appeared to be harmless to both mother and baby in the dosages and method of administration herein described.

Distention of the muscular tissue in the uncurarized patient is by force. The dilatation of the muscular supporting tissues is the result of fatigue. The forces which produce this fatigue are transmitted through the presenting part, which in almost every instance is the fetal head. If we employ a substance which will cause relaxation of the muscular support of the pelvic diaphragm the forces necessary for dilatation will be decreased. It therefore follows that with reduced resistance to the fetal head less trauma will be encountered. If trauma during labor is a factor in cerebral injury the incidence should be reduced in the curarized patient.

It must be kept in mind that curare is not a panacea. It will not overcome cephalopelvic disproportion, cervical dystocia and malpositions. However, it aids somewhat in operations to overcome the latter. Thus judicious and indicated usage of curare is required along with the usual diagnostic acumen necessary in obstetrics. This drug could be abused both in indications for its administration and dosage. Because the number in this series is insufficient for a final conclusion and because of the inherent dangers of curare it should be used at present only in those well regulated hospitals wherein the services of a competent and experienced anesthesiologist are available constantly.

In the future, probably a purified or refined product of curare will be available which will prove to have selective action and less undesirable side effects. It is also possible that a dosage index in relation to the patient's weight may be determined. In this event the likelihood of undesirable side effects would be decreased and the maximum efficiency of the drug obtained.

SUMMARY

Curare was used in 200 deliveries during the second stage.

(1) It proved harmless to mothers and babies in the dosages herein described.

(2) It did not interfere with the forces of labor in the second or third stage.

(3) It proved to be a valuable adjunct to anesthesia and analgesia.

(4) It proved to be of value in operative obstetrics.

(5) The perineal muscles evidently are affected by divided intravenous doses of curare before undesirable side effects appear.

(6) It had questionable value in the first stage of labor.

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DISCUSSION (*Abstract*)

Dr. Willis E. Brown, Little Rock, Ark.—Apparently curare is in a position quite similar to the use of local and regional anesthesia. It causes a relaxation of the pelvic floor essential for the eventual dilatation of the pelvic floor muscles. Either they must be dilated by fatigue and overdistention, or chemically.

A few years ago we saw the widespread misuse of a very excellent agent, caudal anesthesia, by those untrained and unskilled in the general field of anesthesia, to the detriment of the method. I should like to raise the same caution with regard to curare. Whatever place it may eventually attain, it could well be killed in its birth by injudicious and unqualified use at this time.

Apparently it should be used only in a hospital where good anesthesiologists are available to assist not only in the control of perineal relaxation, but also in what will inevitably come to be respiratory embarrassment on the part of the mother as the dosage of curare accidently becomes excessive for a given patient. A good hospital team, therefore, not only of the anesthetist but also of the operating room or delivery room, is essential.

Some concern should be felt regarding the possible effect upon the fetus. It would be wise for a careful pharmacological investigation of the placental transfer of this substance to be included in any future studies. Should fetal embarrassment occur by virtue of the type of labor, or by virtue of the drugs used for analgesia, the further interference with the muscular activities of the diaphragm and the intercostal muscles might make resuscitation very difficult.

In the final analysis, then, curare as an aid in the relaxation of the perineum has been explored and well presented to us. We must consider that it is in competition with other agents which accomplish the same thing. The present use of saddle block, the recent use of caudal, and the use of local anesthesia either by a pudendal block or transsacral block, both accomplish this same end. Also, ether, while much less satisfactory, will accomplish the same perineal relaxation.

Eventually, then, curare will have to compete and to be evaluated with these other agents for carrying out perineal relaxation from the standpoint of simplicity, safety, and effectiveness.

Dr. Samuel M. Dodek, Washington, D.C.—Early in 1947, my associate, Dr. Joseph Friedman and our anesthetists, the Drs. Katzman began a study along the same lines. However we approached the subject from a somewhat different viewpoint. That investigation, which appears in the current "Medical Annals of the District of Columbia," will contain the combined experience in some 400 cases.

We were impressed with the experience of previous observers using curare in general surgery and the effect of that drug upon the voluntary and semi-voluntary muscles. We thought it might have some place in vaginal obstetrics also. We have been most impressed with its value and help.

We did not approach our investigation, as Drs. Hartnett and Freiheit did, to determine the value of curare in reducing the amount of analgesia or anesthesia that might be necessary at the time of delivery, but for what aid it might offer at the actual time of delivery, in relaxing the perineal muscles and thereby preserving them.

All of our cases are delivered by one method of operative obstetrics or another, with very few exceptions, and they are therefore entirely anesthetized at the time of delivery. We never use nitrous oxide, as the authors do. I think that in Washington its use is reserved for administration in the presence of an open flame or cautery and in dental surgery. Ethylene gas is our choice of general anesthetics, and analgesia is obtained by the administration of "seconal" and "demarol," occasionally combined with scopolamine, and intravenous "nembutal."

Our procedure has been to inject into the patient's vein 2-3 cc. of d-tubocurare, when she is under the influence of the general anesthetic and at the time she is being prepared for delivery. The perineum is palpated by the operator before the injection of the drug, and at intervals of from 1 to 5 minutes thereafter, in order to determine or estimate the degree and progress of relaxation.

We have found, like Dr. Hartnett, that relaxation is marked in from 87-90 per cent of the cases, when the tone of the perineum is compared to what it was before the injection of curare.

Of our cases some 49 per cent were primiparas. However when we reviewed the findings made in all of the patients studied, at the time of their sixth week postpartum examination, we found that each of 87 per cent had a very firm perineum.

As a matter of fact our clinical experience indicated that the primiparous patient who had received curare had a perineum which was similar in tone and firmness to her perineum before childbirth. It was nulliparous in its tone. The multiparous woman in our group had a perineum similar in tone to that which the primiparous patient used to present on sixth week examination. Before the use of curare, we were convinced that no matter how skillful was the technic of any obstetric operator, the perineum of the woman who has had a baby could never be the same as it was before.

The relaxation of the muscles of the perineum is so sufficient that it is rare that the superficial transverse perinei muscle is ever involved or severed when performing a mediolateral episiotomy. Also, the relaxation is so marked that much less traction has to be exerted upon our forceps.

The combined effect of curare upon the perineal muscles and the semivoluntary muscles of the pelvis is so great that there is much less hazard to the after-coming head and trunk of the baby in breech extractions for primary breech presentations, and for breech extractions following internal podalic version.

I believe the use of curare in the hands of skillful obstetricians and their anesthetists will go a long way toward preserving the perineum of our multiparous as well as our primiparous patients.

Dr. Howard Katzman, Washington, D. C.—My experience with curare, including several thousand surgical cases as well as 400 obstetrical cases, shows that curare does not pass through the placenta nor relax the uterus. Curare, by its ability to produce effective relaxation of striated muscle and not to interfere essentially with the physiologic processes of the body, has diminished, if not eliminated, the pushing or oversaturation of the patient with any one anesthetic. Therefore, curare lessens anesthetic hazards.

No obstetrical cases in my experience required oxygen insufflation or use of prostigmine to combat respiratory depression. Babies showed no effects of the drug, and resuscitation times in these babies were comparable to those whose mothers had the same sedation but no curare.

One of the discussants observed that ether gave the same relaxation as curare, but ether would require a percentage of third plane deep anesthesia, which is a definite hazard to the uterus, and increases postpartum hemorrhage.

Dr. R. M. S. Barrett, St. Louis, Mo.—In the past ten years we have seen the introduction of caudal continuously, spinal continuously, and then early in the war Adriani's saddle block. Since the general use of those three procedures has come into the hands of everybody, and in our hands, too, we have observed that none of these technics is perfect in itself, because too many obstetricians are meeting with an increase in the incidence of transverse arrests, mid- and high forceps.

I am not particularly familiar with the mechanism of labor, but I recall that the inaccurate use of caudal and spinal, whether it be saddle block or continuous, will certainly inhibit or diminish the tone of the abdominal muscles.

Further, I thought the trough formed by the levator muscles was an instrument for internal rotation; so with the complete absence of tone in the levators, and impairment in the abdominal tone, we shall have more transverse arrests with those procedures.

I do not know how one can tell the difference between atony producing a transverse arrest and pathology. Cesarean sections have been done after the transverse arrest has been identified later as something of a pathologic character.

The caliber and character of deliveries, the nocturnal prowlings necessary, the economics involved, and the interference with our surgical procedures or surgical anesthesia, in general, have discouraged anesthetists from being too enthusiastic about that field; but with the development of effective antibiotics, the morbidity and the mortality at the present time depend upon two things: hemorrhage and anesthesia.

Dr. Hugh G. Hamilton, Kansas City, Mo.—I am satisfied as to the safety of this drug if it is used intelligently and carefully.

Several precautions should be taken. First of all, competent anesthetists must be available in the event that one has the misfortune of observing a respiratory palsy.

One of the earliest signs of impending muscular paralysis is the paralysis of the external rotator of the eye, the sixth. One has a warning point there. Always have adequate oxygen available for these patients. Have an airway present, and have someone who is capable of performing proper resuscitory methods.

If delivery is not complete before the first dose of curare has worn off, and the time will be variable according to the type of curare that is used, remember that even though curare is allegedly metabolized and withdrawn in twenty to forty minutes, a second dose has an additive effect, and subsequent dosages must be smaller than initial doses.

Dr. Hartnett (closing).—Dr. Brown has raised the point that a study should be made to determine the presence of curare in the babies. From the information we have, curare is excreted in the urine and its presence can be determined by a rather complicated chemical analysis. At the present time we are attempting to study the urine obtained from the newborn babies and if curare is present it can be identified.

Drs. Dodek and Katzman should be complimented on their large series of cases and the results are extremely interesting. First their report is important because the results have shown no ill effect on mothers or babies with a dosage of curare which doubles that which we have used in this series. Secondly, they have reported excellent anatomical results following delivery, which in my series I have not had the opportunity to observe during the postpartum period. While their approach has been from a different standpoint I feel it gives evidence that curare if given in the dosage advocated in our paper will be found to be safe. Our attempt in its use has been to reduce the anesthetic and analgesic requirements.

We have found curare extremely valuable in those instances where the patient enters the hospital near delivery having recently eaten a full meal. With the use of curare we have been able to carry the patient under such light anesthesia (nitrous oxide and oxygen) that the vomiting reflex is not excited.

My experience with saddle block is limited. At City Hospital in St. Louis approximately a thousand patients have been delivered with this type of anesthesia. The incidence of forceps deliveries has been rather high. Since this investigation has begun, the incidence of spontaneous deliveries has been greatly increased, which I believe is a better obstetrical practice.

Dr. Barrett has raised the question of the possibility that the process of internal anterior rotation is interfered with because of the relaxation of the levator muscles. This would, therefore, increase the number of transverse arrests. While this type of dystocia has occurred it does not seem to me to be higher in incidence than would ordinarily be observed in a series of two hundred obstetrical cases. In such instances it has been possible to apply forceps under light nitrous anesthesia, or local, or to perform manual rotation without anesthesia.

CANCER OF THE CENTER FACE*

By J. B. Howell, M.D.
Dallas, Texas

The center of the face is a common location for cutaneous cancer. A special tendency to invasive growth of basal cell epitheliomas is noted when it occurs in this situation. The area is one in which the therapeutic approach is more difficult, requires more skill, and failure of the primary or initial treatment is frequent. Forty-one per cent of a small series of cases of cancer of the eyelids, canthi, and nose had received previous inadequate treatment before referral to the Oncologic Hospital of Philadelphia.[1] Over one-third of the cases of cancer of the nose treated by Mohs had been unsuccessfully treated by previous surgery or irradiation or both.[2]

The well-trained therapist makes an all-out effort to rid the patient of cutaneous cancer with his first individualized treatment plan. The use of low intensity radium needles interstitially for cancer of the nose and periorbital region is a technic worthy of greater usage and more widespread popularity. This method was introduced by Regaud[3,4] in 1924. Sir Stanford Cade[5] of England and Dr. Charles Martin[6] of Dallas have pioneered this technic and established its merits as one of the outstanding methods of approach to the problem of cutaneous cancer. In early lesions of the septum, floor of the nose, or outer nasal wall, interstitial radiation as the sole method of approach is simple, safe, gives good results, and is followed by little post-radiation inconvenience.

Advanced lesions of the nose can be successfully treated by interstitial radiation even if the alar cartilages are involved providing the septum and palate are free from the disease (*Fig. 1*). In such cases there is inevitably a loss of tissue as the cartilages are destroyed by the disease prior to radiation.[7]

Cancer of the nasal vestibule if small and accessible can be treated successfully by the low intensity radium needle used interstitially.

The advantages of this approach are chiefly these: a lesion involving the entire nose may be needled properly without development of painful chronditis or necrosis of cartilage. The cosmetic results are good. Dosage calculations are possible.

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*Read in Section on Dermatology and Syphilology, Southern Medical Association, Forty-Third Annual Meeting, Auspices Campbell-Kenton County Medical Society of Northern Kentucky, held in Cincinnati, November 14-17, 1949.

The approximation of the radioactive sources to the cancer is more accurate. The lateral and downward extensions of the lesion can be covered more accurately and adequately. Silent extensions are less likely to occur since an area 0.5 cm. beyond the needles in all directions receives cancericidal dosage. The time factor favors a selective destruction of carcinoma with minimal damage to cartilage. The rate of cure is high. Large and infiltrating lesions can be successfully managed.

Technic for Needling.—Phenobarbital ½ to 1 grain is given as pre-medication 20 to 30 minutes before anesthesia is induced with procaine hydrochloride. The extent and depth of the lesion should be very accurately estimated. When a tumor is elevated well above the surface, the presenting portion is removed by electro-surgery. If the lesion is over 4 or 5 cm. in diameter, the pattern of needle placement should be diagrammed to scale and an isodose curve for the needles consulted (***Fig. 9***). This will give the therapist the dose at the edge and center of the lesion so that adequate dosage can be given to the margins and overdosage can be avoided in the center of the lesion.

Care is exercised when inserting the needles to avoid injury to cartilage, perforation of the skin or of the septum.

A spearpoint scalpel is used to make a small stab incision in the skin. The needles are inserted in a single layer approximately 1 cm. apart in a previously arranged pattern so that accurate coverage of the base and the borders of the lesion is carried out. The needles remain *in situ* for 168 hours. They are usually anchored by a fixation suture to

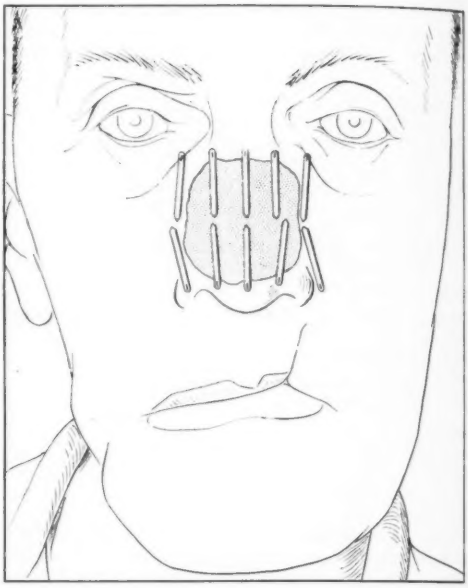

Fig. 2

Superficial basal cell epithelioma involving skin of almost entire nose. Successful clearing of cancer with low intensity interstitial radium needle therapy. Pattern of needle placement used depicted.

Fig. 1

Huge, bulky, rapidly expanding, Grade IV prickel cell cancer. Epithelioma destroyed skin, cartilage, and mucous membrane. Photograph 13 months after interstitial radium needle therapy by Tumor Clinic Group, Parkland Hospital. Demonstration of successful treatment even with cartilage involved.

Fig. 3

Photograph taken two years after therapy. Radiation sequelae are lacking to date. Needling carried out by Tumor Clinic Staff of Parkland Hospital.

normal skin or by inserting the needles in opposite directions and tying the threads together across the lesion. The dose varies from approximately 6,000 to 12,000 gamma roentgens. The needles used have an active length of 0.5, 1.5, and 4.0 cm. and contain 0.66, 1.33 mg., and 2.4 mg. of radium respectively. They are made of platinum iridium and have a wall thickness of 0.5 to 0.6 mm. and contain 0.66 mg. of radium per cm. of active length. For the inner canthus a curved needle has been prepared for use in this particular locality (*Fig. 8*).

The patient may be hospitalized and the needles implanted and checked once or twice daily to see that they remain fixed in place. My practice has been to allow the patient to remain in town or at home and to check the needles daily. A gauze dressing is applied to the area and changed daily. Occasionally an intelligent patient living within a range of 150 miles of Dallas is allowed to return home and to be observed on alternate days. Work often can be continued with the needles in place. Surprisingly little pain is experienced from the needles after they are implanted in the tissues. Removal of the needles is usually without pain and can be carried out in a very few minutes.

Postradiation Effects.—In most cases, if the technic of needling is accurate, the filtration adequate, the intensity low, and the time factor sufficiently long, there are no marked post-radiation ill effects.[7] A minor effect is the formation of adhesions between the septum and outer nasal wall. The adhesions may be limited to two to three fine bands or a complete diaphragm with or without a small central perforation. A postradiation condronecrosis of the septum or alar cartilages occasionally occurs. This leads to a perforation of the septum or the ala of the nose. This requires excision of the necrotic area and at times a plastic repair of the deformity. Sclerosis followed by diminution of the size of the nostril or even complete obliteration of the nostril may occur if inadequately screened needles are used or when the total dosage is too great. In advanced cases it is impossible to determine how much tissue destruction will result. In some the deformity may be appreciable. When a large area has been irradiated, the skin does not tolerate trauma, a small herpetic infection, or pyoderma well. Occasionally ulceration will follow one of these minor insults. Infrequently one sees an area of depigmentation following irradiation. The border of the depigmented area is hyperpigmented and there may be in addition a zone of comedones at the periphery of the treated area. Such changes are usually not permanent.

Extensions.—Mohs[2] reports a striking case of a basal cell carcinoma of the nose. His case illustrates well the degree and route that extensions can follow. The lesion progressed in spite of competent radium, radium seed, x-ray, and surgical therapy given over a period of 21 years. The entire nose was cancerous. The septum, turbinates, all the walls of the nasal cavity, the left antrum, the mucosal portion of the

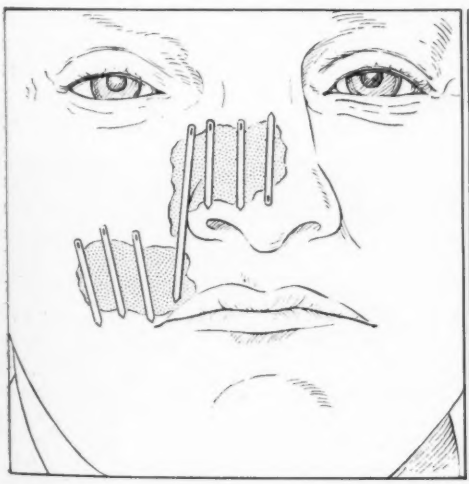

Fig. 4

Patient with multiple primary basal cell epitheliomas of face. Two confluent lesions shown involving right side of nose, nasolabial sulcus, and upper lip. Technic used for needling illustrated.

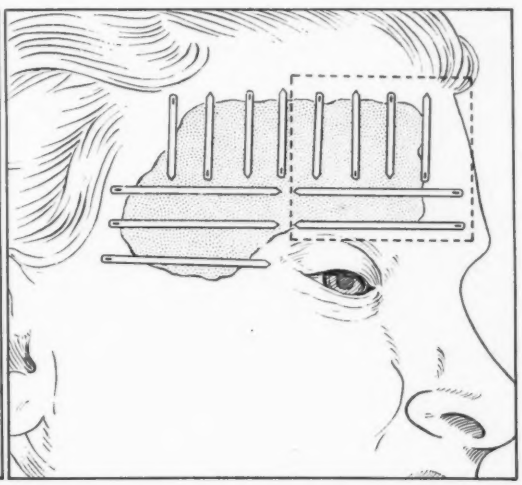

Fig. 5

Extensive superficial basal cell epithelioma of temple and forehead. More than 8 cm. in greatest diameter. Area interspersed with cancer and dense connective tissue from an earlier treatment with acid. Needling done in two stages three months apart. Pattern of needle placement diagrammed.

upper lip, the anterior half of the hard palate, the periosteum of the right cheek bone and the floor of the right orbit were involved. The orbital portion extended posteriorly to the orbital rim for 2 cm.

Histologic Type of Lesion Involving the Nose.—Carcinoma of the nose is predominantly basal cell in type. The percentage of prickle cell epitheliomata may vary somewhat in different sections of the United States and is greater in the South and West than in the North and East due to the carcinogenic effects of sunlight. Mixed or baso-squamous epithelioma occurs on the nose and 10 to 20 per cent of cases reported of basal cell type will have prickle cell elements if an adequate search is made.

Mohs[2] treated in a period of nine years at the University of Wisconsin 243 cases of carcinoma of the nose. Only 33 were squamous cell and 210 were basal cell epitheliomas.

Diagnosis.—The diagnosis of cutaneous cancer is made on the microscopic examination of material from an area suitable for biopsy. Evaluation of the section and the pathologist's opinion should precede plans for treatment.

TREATMENT RESULTS

The number of cases reported is too small and the length of the follow-up too brief for the results presented to be of statistical significance.

Fig. 6
Photograph taken 12 months later showing excellent response to therapy. Remains well to date. Treated at Parkland Hospital by Tumor Clinic Staff.

Nineteen epitheliomas of the nose were treated: Eight were in private patients and 11 cases were treated in the Parkland Hospital Tumor Clinic. These patients have been followed closely for possible recurrences for one to three years. One failure is reported. This patient died fifteen months after treatment from extension of the carcinoma into the ethmoid sinuses, the orbit, and the base of the brain.

Fourteen epitheliomas of the lids and canthi were treated and carefully followed for one to three years. Seven lesions were treated at the Tumor Clinic of Parkland Hospital and 7 in office practice. No failures have occurred to date in this small group.

Dr. Charles Martin* of Dallas has treated 27 epitheliomas of the lids and canthi. Satisfactory primary healing occurred in 24 cases (88.8 per cent). Fifteen cases were treated five or more years ago. Eleven are alive and well five or more years after treatment (73.3 per cent).

CANCER OF THE LIDS AND CANTHI

Histopathology.—Cutaneous cancer of the lids and canthi pathologically is predominantly basal cell in type. Approximately 15 to 20 per cent of basal cell epitheliomas, however, have prickle cell components and are therefore capable of metastasis.[8] Squamous cell epithelioma is less common. Cancer of the lids and canthi is not more resistant to irradiation than cancer elsewhere. Statements regarding the refractoriness to radiation therapy indicate to me that insufficient coverage of the periphery of the lesion and inadequate depth dose probably are responsible for recurrences.

Location of Lesion.—Hunt[9] observed that there is a remarkable predilection for cancer to involve the medial portion of the lower lid and the area about the inner canthus. Four-fifths of the lesions in Hunt's series occurred in these combined areas. Forty-eight per cent occurred along the lower lid chiefly along its medial portion; 34 per cent about the inner canthus; 6 per cent along the upper lid; and 12 per cent adjacent to the outer canthus. Stallard's[10] series of 422 cases was divided into 193 lesions situated about the inner canthus; 151 along the lower lid; 59 along the outer canthus; and 19 involving the upper lid.

Extension and Metastasis.—Epitheliomas of the canthi present weighty problems chiefly due to their strategic location; their relation to important struc-

*Personal communication.

tures, and because of their habit of early infiltration of inaccessible sites. Squamous cell epitheliomas metastasize to the superficial and deep parotid nodes in front and below the ear from lesions situated on the lateral three-fourths of the upper lid and the later aspect of the lower lid. The medial group of lymphatics drain the region of the inner canthus and the medial three-fourths of the lower lid following the course of the facial vein down into the submaxillary group of nodes. Both the parotid and submaxillary nodes are drained into the deep cervical nodes near the junction of the common facial and

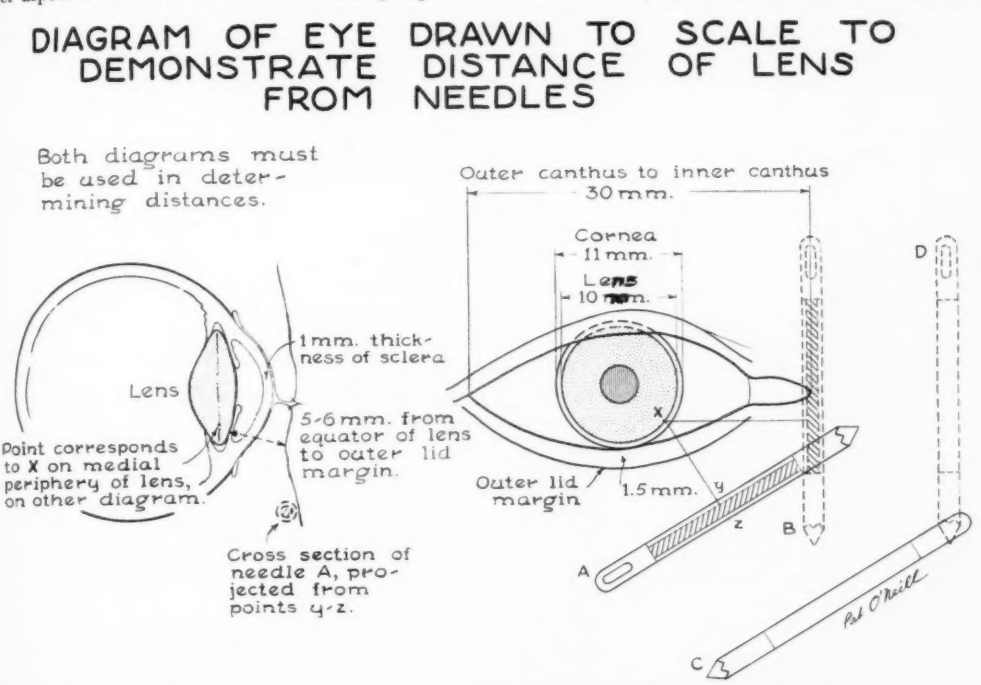

Fig. 7

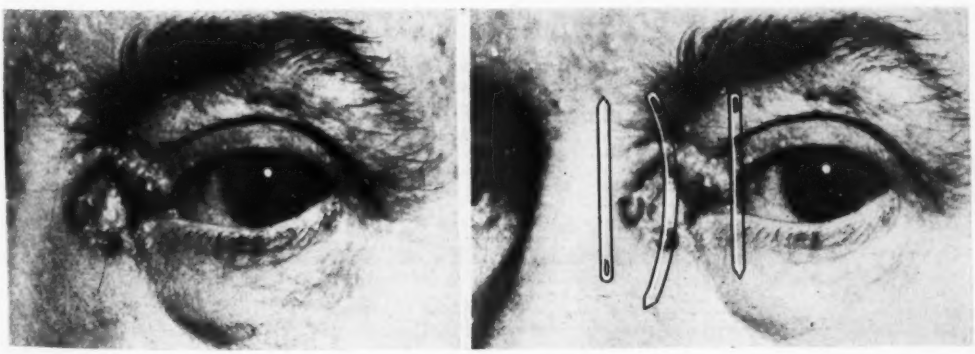

Fig 8

Rodent ulcer infiltrating region of medial canthus and both lids. Diagram demonstrates a pattern for needle placement. A curved needle has been developed for use in the medial canthus area. Photograph used is an excellent picture of the clinical features of cancer of the lids and canthus. (From Richards, G. E.: Radiotherapy in Lesions about the Eyes. Am. J. Roentgenol. and Rad. Therapy, **36**:588, 1936. Reproduced by permission.)

internal jugular veins.[11] By direct infiltration carcinoma involves the conjunctiva, the lids, the eyeball, lacrimal duct, ethmoidal sinuses, the opposite canthus, the orbit, and by extension the base of the brain.

Indications for Radium Needle Therapy.—In my practice cancer of the lids and canthi, excepting the very superficial lesion measuring approximately 1 cm. or less, is given the benefit of interstitial radium. This reasoning is based on the greater potential danger of cancer of this locality.

The use of low voltage x-ray therapy for superficial lesions of small size involving the central portion of the lower lid is an excellent procedure and is considered the treatment of choice by many. With the use of the proper eye shields the lens receives practically no irradiation. For infiltrating lesions of the canthi and lids, x-ray therapy is in-

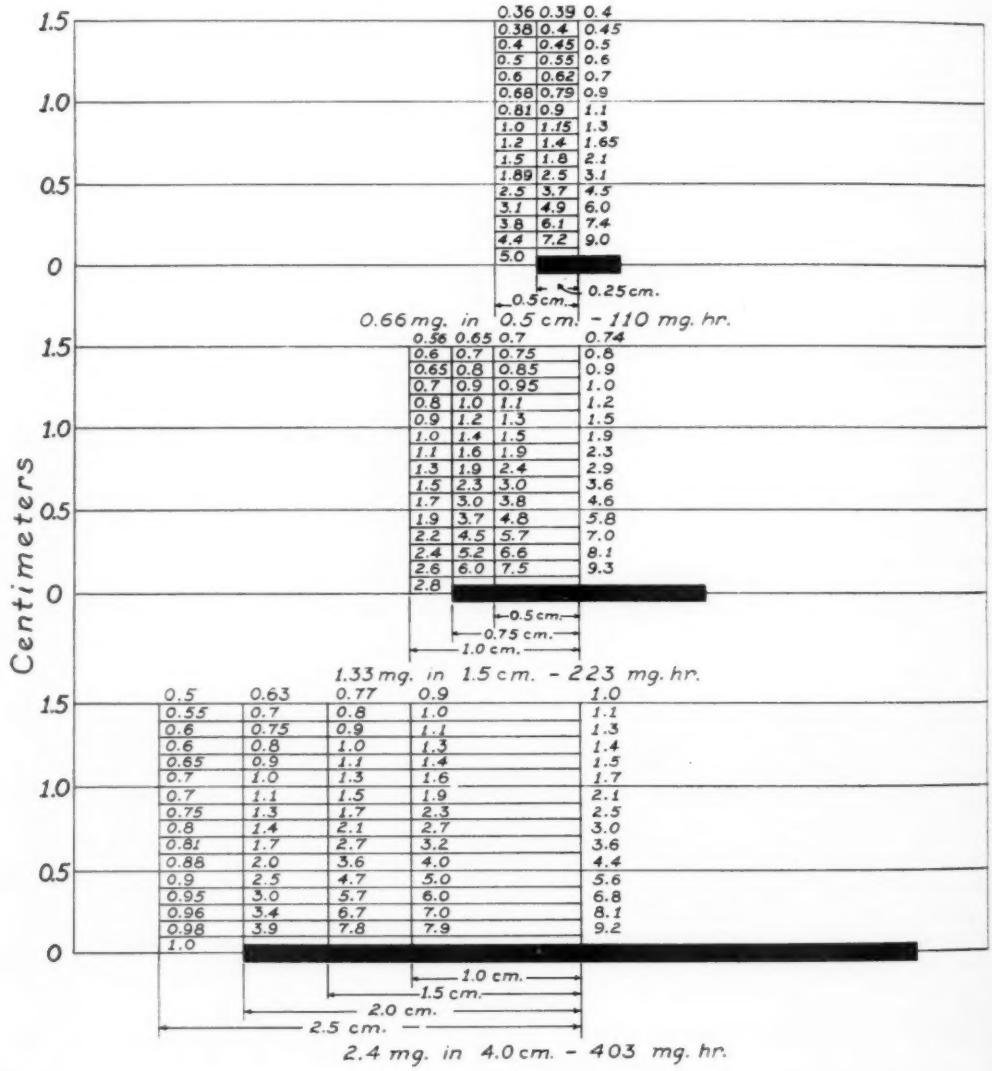

Fig. 9

Doses delivered at various points about the active lengths of three low intensity radium needles in 168 hours. The figures are converted into gamma roentgens when multiplied by 1,000. (From Martin, Chas. L.: The Time Factor in Radiation Therapy. Am. J. Roentgenol. and Rad. Therapy, **59**:5, 1948. Reproduced by permission.)

ierior to low intensity radium needle therapy. X-ray therapy frequently is followed by recurrences and the depth dose received is often inadequate for lesions situated in the region of the inner canthus. It is in this situation that treatment with the low intensity radium needle has proven most valuable. I would not treat with radium needles a lesion which recurred following a cancericidal dose of x-rays or radium or a lesion which has invaded the orbit to a degree which cannot be accurately estimated or to an extent considered beyond the range of depth dose of the needles. In such a situation the chemosurgical excision method of Mohs is often a life saver.[2]

Untoward Effects and Hazards from Radium Used About the Eye.—Philippa Martin[12] made these observations on the effects of radium on the eye: The changes observed are chiefly at the expense of conjunctiva and skin. The eye with the exception of the lens is somewhat radio-resistant. The first effect usually is a conjunctivitis which can, however, be an early or a late change. The early changes are edema, hyperemia, chemosis, and a serous or mucopurulent discharge. The conjunctival reaction is painless; pain indicates the onset of iritis. The appearance and disappearance of the early conjunctival reaction is similar to and coincides with the skin reaction. The late effects on the conjunctiva are scarring, thickening, adhesions to the sclera, ectropion, and epiphora. Irradiation iritis is rare varying in degree from slight swelling to definite iritis with posterior senechiae; it tends to resolve spontaneously without a relapse. Radium necrosis of the cornea is a very rare and delayed reaction (3 months after radiation). It may follow a single severe treatment or after repeated treatments. Very rarely corneal ulcer follows in the wake of a primary irradiation reaction. Glaucoma is a relatively rare and uncommon danger from irradiation. Fibrosis of the lacrimal duct infrequently occurs as a sequel of radium used in the vicinity of the medial canthus.

Cataract.—Milner[13] says that the exact process whereby the lens undergoes a change as a result of radiation has not been determined. It is agreed that the opacities are due to a disturbance of the nutrition of the lens; and as a result of this, chemical reactions take place leading to coagulation of the lens proteins and loss of transparency. Typical radiation cataract is a posterior cortical one. The mature radium cataract possesses no special features and is amenable to surgical therapy. The latent period between radiation and cataract formation varies from a few months to several years. The average latent period from the available published cases is approximately two years.

The conclusion seems warranted that the mature crystalline lens of adult animals and man possess a high degree of resistance to irradiation. Nevertheless, the mature lens of adult animals and man can be made to undergo degeneration by sufficiently strong irradiation. Lenticular changes in the mature eye of adult animals can be produced only by doses several times greater than the normal skin erythema dose.[14]

Unfortunately the minimal dose of radiation capable of producing cataract is still unknown. Cutaneous cancer of the lids and canthi is a disease of old persons primarily of the fifth through the seventh decade. This is also the age group in which cataracts are not uncommon. I have frequently received the ophthalmologist's report of bilateral early lenticular opacities in patients sent for examination before the use of radium interstitially about the eye. The danger of loss of the eye, and infrequently life, from cutaneous cancer of the lids and canthi is usually greater than the smaller risk of irradiation cataract at some date a few years hence. Weighing the dangers from the disease as compared to the potential and infrequent sequelae of cataract from using low intensity radium needles will be made more easy from a careful analysis of the following work. One can approximate the dose of irradiation the lens receives. The distance of the lesion from the lens is first determined.* Using an isodose curve for the needles employed[15] one can estimate the number of gamma roentgens the lens receives (*Fig. 9*). The corrected approximation of the dosage is then calculated by making adjustment for the time factor.[16 17] An epithelioma involving either the medial or lateral canthus is approximately 12 to 15 mm. from the lens (*Fig. 7*). The maximum amount of radiation received without correction for the time factor is approximately 1000 to 740 gamma roentgens (535 to 399 with correction). This represents the dose taken from the middle of the closest needle (27 mm. length) placed in the inner or outer canthus. Points 20 mm. from a low intensity radium needle receive so minute an amount of radiation that it is negligible. Although the

*To figure the distance from the equator of the lens add (1) thickness of the lid, an average 1.5 mm.; (2) distance from edge of lesion to lid margin; (3) thickness of sclera, average 1 mm.; (4) depth of anterior chamber, angle and thickness of iris (approximately 3.5 mm. from limbus to equator).

minimum requirement for radiation cataract is still unknown, it seems likely that the above dose is within safe limits.

Lesions located approximately 5 mm. medially or laterally from the center of the lower lid are seen frequently. The lens is 10.5 to 11.5 mm. distant from the margin of such a lesion. One ordinarily may place the closest needles 3 to 5 mm. from the edge of such a lesion thus increasing the distance from the lens to approximately 13.5 to 15.5 mm. A cancericidal dosage of radiation is delivered for a distance of 0.5 cm. in all directions from the needle. The lens receives radiation of inconsequential amounts from the second needle which is over 2 cm. away from the lens. The dose received at 13.5 mm. is approximately 850 gamma roentgens for the 27 mm. needle; with correction for the time factor it is 459. At 15 mm. it is 740; at 11 mm. distance away the lens would receive approximately 1200 gamma roentgens; with correction for the time factor it is 643.

A lesion situated near the center of the lower lid is only 5 to 6 mm. from the nearest margin of the lens. The closest needle would, therefore, be approximately 8 mm. from the lens if one is treating a carcinoma involving the central portion of the lower lid. Using a 27 mm. length needle placed parallel to the lid margin the lens would receive approximately 2300 gamma roentgens from this needle. A second needle placed 18 mm. away from the lens (10 mm. from nearest needle) would contribute another 500, totalling 2800 gamma roentgens. (With correction for the time factor the total dose amounts to approximately 1500 gamma roentgens). Knowing that a cancericidal dose of radiation is delivered for a distance of 0.5 cm. away from the low intensity needle, one should implant the closest needle approximately 5 mm. from the lid margin even though the margin is infiltrated with carcinoma. This places the source of radium a full cm. from the nearest point of the lens and allows, due to the factor of distance, practically negligible radiation from a second needle placed 2 cm. away from the lens. Without correction for the time factor the lens will receive in this particular situation 1500 gamma roentgens and 803 with correction. This insult to the lens is justifiable if the lesion is an infiltrating or dangerous one. One must remember, however, that in most instances superficial x-ray therapy is perhaps equally effective and the lens can be protected completely with the use of the proper eye shields.

Judging from the results and experiences of Drs. Charles Martin,[18] Cade, Driver, Shelmire, Lamb, and others who have employed low intensity radium needles for more than a decade the incidence of post-irradiation cataract is small. Driver[18] says that he now uses needles about the eye infrequently. He has observed three cases in which he believed that cataract was the result of radium therapy. However, the lenticular opacities occurred five years after radium treatment.

Calculation of the dose the lens receives when small lesions involving the lid and canthi are treated indicates that the chances for post-irradiation cataract are minimal. In a large infiltrating lesion which endangers the eye and even life, the danger of a future cataract as a complication of low intensity radium needle therapy is outweighed by the gravity of the disease.

The objective of this study would be missed completely if one carries away the idea that anyone can treat lesions about the canthi and lids without regard for possible damage to the lens and other important neighboring structures.

Consultation on the eye measurements was furnished by Dr. Dan Brannin of Dallas.

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DISCUSSION (*Abstract*)

Dr. Howard Hailey, Atlanta, Ga.—In a paper read before this section when the Southern Medical Association met in Miami, in November 1929, I presented illustrations depict-

ing the interstitial use of 5 mg. needles. They were inserted at 5 to 8 mm. apart depending on the size of the lesion. It has been my experience that needles may be used along the eyelids most satisfactorily when applied externally. In the management of epitheliomas involving the canthi, I use full strength radium plaques as designed by the late Dr. Nathan Beers of Brooklyn, New York.

The one objection to using needles which contain very small amounts of radium is the long time element. The knowledge that radium treatment is going on for a week increases fear and causes mental unhappiness. Many patients will submit to radium or x-ray because pain, cutting, hospital care and expense are eliminated. Many of my patients come long distances and desire to go back home the same day. Elderly couples who live on the farm cannot go a long distance and stay for seven days while taking treatment. When larger amounts of radium are used, treatment can be administered within the day. The patient must be given consideration from many points of view.

A few patients who had cataracts prior to radium treatment have told me they could see much better after the treatment. An elderly woman reported her hearing was much better after radium treatment.

If bone or cartilage is involved, radium should not be used but the patient should be in the care of a good radical surgeon.

Dr. Dudley C. Smith, Charlottesville, Va.—Low intensity radiation can be applied by using small radium needles (as described by Dr. Howell), by implanting radon seed and by repeated applications of small amounts of x-ray (modified Coutard method).

All living cells are continuously undergoing complicated biologic changes. Neoplastic cells are usually in a heightened state of metabolic activity, as indicated by the presence of mitotic figures. In this abnormal cellular state, at least in some stage of it, there is an increased susceptibility of the cell to damage from irradiation. At certain phases of the cellular life, relatively small amounts of irradiation will be lethal to the cell. This amount of irradiation does not produce permanent damage to the normal cells or to the neoplastic cells not in this susceptible stage. If this amount of treatment is continued over a period of time it will affect lethally other neoplastic cells.

From the technical or operative standpoint, radon seed have advantages in that they stay in place better and do not have to be removed. The half-life of the radiation though is only about four days.

X-ray in repeated small doses is easy to apply and is uniform over a large area if the proper distance is used.

The optimum time factor has not been determined in all varieties of malignancies, but should cover a sufficient period to allow each cell to reach the stage most sensitive to irradiation. Coutard recommended two to three weeks.

I agree with Dr. Hailey that if cartilage and bone are involved, the patient will have a more comfortable convalescence if surgery is used.

Some years ago, an elderly lady with almost mature bilateral cataracts was treated with radium for an epithelioma (rodent ulcer type) of the nose. The lesion was completely cured. About eight months later, examination showed the lenses had almost entirely lost their opacity and operation was not necessary.

RATIONALE OF INTRAMEDULLARY FIXATION OF FRACTURES BY THE LONGITUDINAL PIN*

By LESLIE V. RUSH, M.D.
Meridian, Mississippi

The principle of intramedullary fixation of fractures, while still developmental, now has many advocates. In America it has been given impetus by the writings of certain Southern surgeons, notably: Street of Memphis,[1] Berry of Greenville, Mississippi,[2] Stuck of San Antonio,[3] and Fowler of Nashville.[4]

The placing of a splint longitudinally within the hollow substance of the bone, permitting free function of the extremity and body, appears rational. For nearly fourteen years, we have experimented clinically with the method because, in our considered judgment, it possesses potentialities which, when properly developed and properly applied, more closely approach the ideal in fracture treatment than any method which has been yet described.

The technics employed in this work differ in certain essentials from the methods recently described by others.[1 5 6] This phase of the subject, as well as the technics by which the principle can be applied to the various fractures of the long bones of the body, have been described by us in previous communications.[7 8 9 10]

There are two main points at issue concerning the rationale of intramedullary fixation. First, the field of application appears limited. Its use has been considered ill-advised in fractures near the extremities of long bones. But now technics have been developed whereby it can be used most advantageously in a large variety of fractures near joints, and this phase of the subject has recently been discussed.[11] The second point of issue is whether healing is retarded or encouraged by this form of fixation.

From a series of 126 cases, certain observations have been made. There has been no embolism. The period of hospitalization and invalidism has been markedly shortened. Joint stiffness has been minimized and, not only has muscle atrophy been minimized, but the maintenance of the nearly normal muscle tone has shown a profound influence upon the healing of the various fractures (*Fig. 1*). No

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*From Department of Surgery, Rush Memorial Hospital, Meridian, Mississippi.

deaths have occurred and infection has been encountered twice only. A minor superficial infection abated after drainage and chemotherapy. A major infection recurred in a case which had been previously infected following a plating operation elsewhere. In no instance was it necessary to remove the pin because of infection and, in these two cases, the pins proved to be a considerable adjunct in the treatment of the infected extremity.

Certain difficulties were encountered in some earlier cases because improper metals were used. Certain of the metals were too soft while others were too hard and brittle for successful application. Corrosion was a problem in a few cases. Now that type 316 stainless steel is available and can be given the proper hardness, it is believed and hoped that this specter will haunt us no longer. In this conjunction, we should like to pay our tribute to the work of Venable and Stuck[12] in 1936 on the electrolysis of metals. As the result of their work, we now have metals which are relatively inert when implanted within the human body.

Nonunion has been encountered, but in no instance has nonunion occurred when medullary fixation was used in such fashion that constant and continuous compression of bone ends actually occurred.

In an effort to determine the influence of constant impaction of the bone ends on fracture healing, twelve cases of ununited fractures have been operated upon utilizing the intramedullary pin for fixation and, with the exception of a case of tibia fracture, no casts were used. Active muscular exercise of the extremity was utilized in an effort to secure early and continuous contact compression of the bone ends. Bone grafts were used sparingly.

Case 1.—A man, aged 35, had extensive fragmentation of the upper third of the femur three months after injury. There was little evidence of union or malposition. Open reduction was done with longitudinal pin fixation, using barrel stave grafts from the ilium to bridge a bone defect. He wore no cast, and was ambulatory in ten days. Visible x-ray callus was observed in two weeks. Union appeared secure in four months. In this case, a pin of inferior metal was used which bent shortly after the operation and later fractured. Except for slight angulation, a good result was obtained.

Case 2.—A man, aged 28, with a subtrochanteric fracture of the femur, and obvious nonunion without bone contact, was seen three months after injury. Open reduction was done. The bone ends were freshened, longitudinal pin fixation was done, and no cast was used. Immediate muscle activity was encouraged. He was ambulatory on crutches in ten days. There was x-ray evidence of callus in three weeks, and union was secure in three months.

Case 3.—A man, aged 39, had an extremely long oblique fracture mid-third of the shaft of the femur. It had been previously plated elsewhere resulting in distraction, angulation, and poor union. Operation was undertaken three months after injury. Open reduction was done, with removal of internal fixation, longitudinal pin fixation, and no cast applied. There was visible x-ray evidence of healing in two weeks. Union was considered secure in three months. This patient was six feet four inches tall, and had extremely large bones with an unusually large marrow cavity. Because of the oblique nature of the fracture, transverse bolts, constructed of Moore pins, were used. The bolts subsequently fractured, allowing the

Fig. 1

Photograph six weeks after longitudinal pin fixation of a comminuted fracture of the lower third of the humerus. Motion was begun in six days, and there is almost complete absence of muscle atrophy.

bone to shorten three-fourths of an inch. No angulation occurred. Constant and continuous compression of the bone ends resulted with rapid union. Crutches were used for three weeks, and full weightbearing was permitted in six weeks.

Case 4.—A man, aged 36, had nonunion, and an oblique fracture of the junction of the upper and middle thirds of the tibia. He had a transverse fracture of the junction of the middle and lower third of the tibia. Operation was done eleven months after injury, with open reduction. A longitudinal pin was used with circular wire fixation. The cast was worn for six weeks. Full weightbearing was permitted thereafter. X-ray evidence of healing was visible in six weeks. Union was considered secure in seven months.

Case 5.—A man, aged 35, had an oblique fracture of the junction of the middle and lower thirds of the tibia, a nonunion of eleven months' duration. The fibrous union was not disturbed. A chip bone graft was done through a slot cut in the anterior surface of the tibia. It was fixed by a longitudinal pin, with no cast. He was ambulatory on crutches the fifth day, and weightbearing was permitted the sixth week. There was x-ray evidence of healing in six weeks. Union was considered secure in eight months.

Case 6.—A boy, aged 16, had an oblique fracture of the mid-third of the tibia, with a previous Kirschner wire fixation. Operation was done five months after injury, a blind longitudinal pin fixation with removal of the Kirschner wire. No cast was applied. Immediate weightbearing was permitted. There was x-ray evidence of healing in one month, and union was considered secure in three months.

Case 7.—A boy, aged 17, had nonunion of an oblique fracture metatarsal 3 five months after injury. Open reduction was done, and a longitudinal pin used with circular wire fixation. He was immobilized, with heavy doses of penicillin for three weeks because of previous infection. X-ray evidence of healing was visible in one month, and union was considered secure in three months. The adjoining metatarsal 2 was treated by bone graft. Metatarsal 3 healed more rapidly than the grafted metatarsal.

Case 8.—A man, aged 22, had an old compound fracture of the ulna with loss of soft tissue substance and three-inch loss of the shaft of the ulna. A previous split-thickness skin graft had been done. Seven months after the injury, transplantation of a whole section of fibula, was done, the ends stepcut. A longitudinal pin and circular wire fixation were used, with a splint for three weeks until the soft tissues were well healed. Muscular activity was insisted upon. There was x-ray evidence of healing two months, and union was considered secure in five months.

Case 9.—A man, aged 28, was seen three years after

A B C D

Fig. 2

(A) Compound fracture of the junction of the middle and lower thirds of the humerus, with severe muscle damage.
(B) Two weeks after pinning and plastic. Distraction occurred due to the weight of the arm and poor muscle tone.
(C) Note closure of the cleft, after one week of muscle exercises.
(D) Four weeks later the picture shows bone contact and callus formation.

a mangling injury of the forearm. He had nonunion of both radius and ulna, a result of distraction caused by overhead traction in initial treatment of the injury. A previous tibial graft to the radius had fractured in the cast. Open reduction was done. Chip grafts were secured from the old tibial graft to the radius, and longitudinal pin fixation employed with no splint. Vigorous muscle activity of the forearm was insisted upon. X-ray evidence of healing was apparent in six weeks. The union was considered secure four months after pinning.

Case 10.—A man, aged 36, was seen five months after injury, with a fracture of the mid-third of the radius. He had been previously treated elsewhere by plates and screws. An oblique fracture of the ulna was previously fixed by one screw. There was marked mobility at the fracture site. Internal fixation was removed and the ulna pinned blindly. Open reduction of the radius was done. The ends were freshened, and longitudinal pin fixation was done with no splint. Active muscular exercise was begun immediately. There was x-ray evidence of healing of both bones in six weeks. Union of both bones was considered secure four months later.

Case 11.—A woman, aged 37, was seen sixteen months after injury. A delayed union of the ulna had healed with deformity. There was a fracture of the mid-third of the radius. Plates and screws applied elsewhere had been removed six months before because of a draining sinus with nonunion. The ulna was not disturbed. Open reduction was done. A longitudinal pin was introduced into the radius. The medullary canal of the proximal fragment was extremely small and required preliminary drilling before the pin could be inserted, and absolute fixation was not secured. Severe infection was apparent the fifth postoperative day. The wound was opened, splints were applied, and chemotherapy was administered. The acuteness of infection subsided in one week. The splints were removed after three weeks. Drainage persisted with some sequestration. A brace was worn for five months. A draining sinus persisted for five months. Eight months postoperatively, the draining sinus has completely healed. The pin has not been removed. X-rays show the pin to be well tolerated within the bone. There is but one small bridge of bone contact and through this bridge alone bony union is apparent.

In this instance, infection was considered a flare-up of pre-existing infection. It was at no time considered necessary to remove the pin and it is felt that had this case been treated by any other form of internal fixation a poorer result could have been expected.

Case 12.—A man, aged 53, was seen two months after injury, with a delayed union of the lower third of the ulna. He had marked and painful stiffness of the hand and wrist with circulatory disturbance from a previous immobilization. Blind longitudinal pin fixation was done,

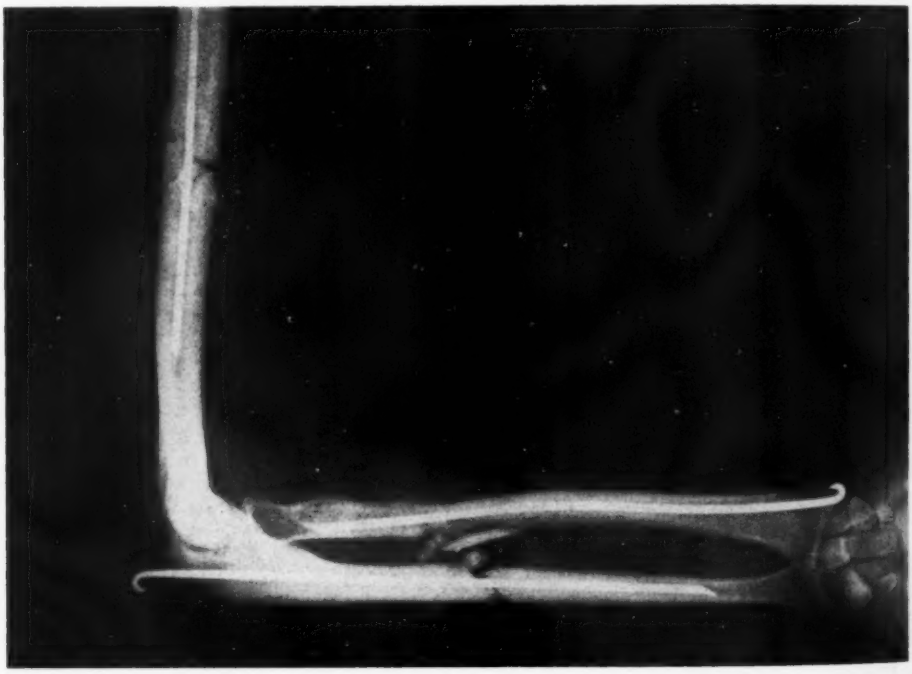

Fig. 3

Fracture of the shaft of the humerus with a comminuted fracture of the shaft of the radius and a compound fracture of the ulna, showing the value of the longitudinal pin in multiple injuries. Note that in the humerus the medullary canal was unusually small, requiring a pin of ⅛ inch diameter. Union was delayed in the fracture because of persistent angulation at the fracture site due to the flexibility of the small pin. Healing was stimulated by applying a Clayton type brace to the humerus alone, allowing full function of the extremity.

with immediate activity of the extremity. Rotation was controlled and good motion secured. X-ray evidence of healing showed in three months, but union is not considered secure eight months from the time of the injury. Here the compression factor was absent because the lower ulna is not acted upon by the musculature.

In reviewing the fresh fractures which were treated by this method, it is observed that fibrous union occurred in olecranon fractures in two instances. This was due to distraction from the pull of the triceps muscle against the olecranon fragment. Nonunion of both bones of the forearm was observed in two instances in which pins of inadequate length were used in compound fractures of the forearm in combination with overhead skeletal traction. Again, distraction of the bone ends was produced with subsequent nonunion, later requiring bone grafts.

Three additional recent cases are illuminating.

Case 13.—A man, aged 39, was seen immediately after injury with bilateral compound fractures of the tibia and fibula. Both legs were treated by irrigation, debridement, and immediate skin plastic, closing both wounds completely after pinning. Long leg plaster casts were applied. No infection occurred in either leg, and the wounds healed uneventfully. Because the fracture was bilateral, the patient could not be ambulatory. The casts were removed in two months, and there was no x-ray evidence of healing in either leg. Casts were applied for the third month. There was marked loss of muscle tone. Mild external rotation occurred in both tibiae because of the weight of the feet with the patient recumbent. There was apparently good bone contact, but no compression of the bone ends. Four months post injury full weightbearing was begun gradually, and x-ray evidence of callus was apparent two weeks after weightbearing. Six months after injury, two months after weightbearing, healing of both legs was considered secure.

Case 14.—(*Fig. 2*) A man, aged 33, was seen six hours after the injury which consisted of a mangled upper arm with extensive maceration of the skin and muscles with compound fracture of the humerus, at the junction of the middle and lower third. He was treated by irrigation, debridement, and longitudinal pin fixation of the humerus with a plastic of the muscles and skin. The extremity was immobilized in "elastoplast" with external plaster splints.

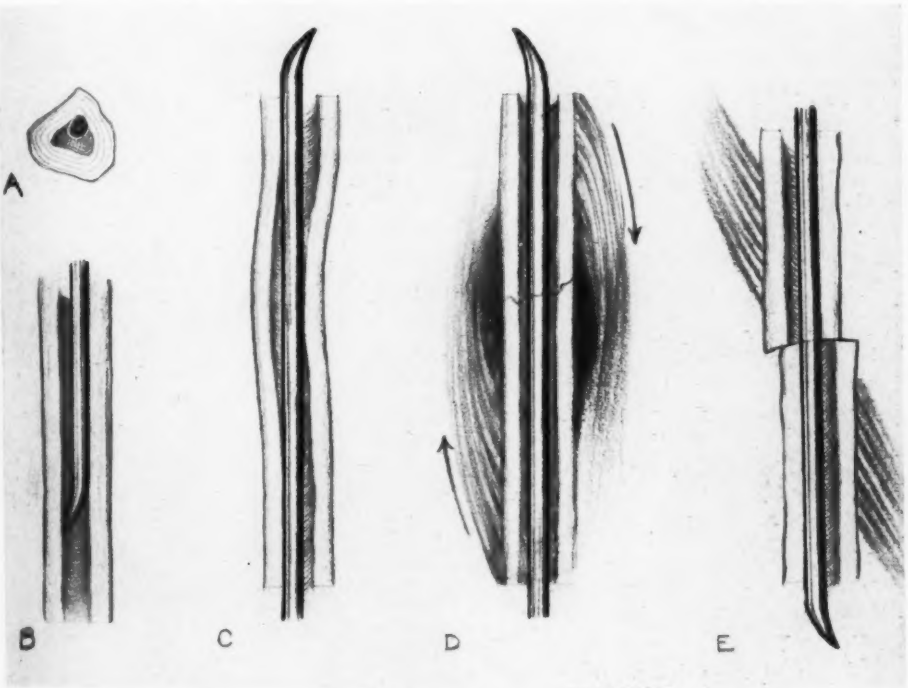

Fig. 4

Diagrammatic drawings show the security of fixation with a longitudinal pin.

(A) In certain regions the round rod fits into natural gutters within the bone.

(B) Due to the pull of the musculature, three-point pressure is exerted in most regions and the point of the pin impinges upon the side of the bone.

(C) Showing three-point pressure from the irregular contour of the bone in certain regions.

(D) The physiologic pull of the longitudinal muscles compresses the irregular fractured surfaces.

(E) Pull of the lateral muscles adds to the three-point pressure by pulling the shaft of the bone against the shaft of the pin.

The postoperative x-ray showed good position. No infection occurred and the wound healed in four weeks with a small skin slough. Three weeks after injury, the x-ray showed distraction of one-half inch and no evidence of callus. This, no doubt, was due to the weight of the arm in plaster splints and to the poor muscle tone of the upper arm. The immobilization was immediately removed and active muscular exercises were begun. A check-up one week later showed much less distraction and no callus. Two weeks after exercise there was very little distraction and little callus. Six weeks after exercise, and nine weeks after injury, there is snug bone contact on the medial surface and healing appears to be well under way.

Case 15.—(*Fig. 3*) A man, aged 24, had a transverse fracture of the mid-third of the right humerus, a comminuted fracture at the junction of the upper and middle third of the right radius, compound comminuted fracture at the junction of the upper and middle third of the right ulna. The injury was three days old when seen. The compound fracture of the ulna had no definitive treatment. There were infected brush burns of the forearm. Nine days after injury open reduction of the humerus was done with longitudinal pin fixation. The medullary canal of the lower fragment was extremely small, barely permitting the passage of a one-eighth inch pin. Fixation was secure except for rather marked flexibility at the fracture site. Two weeks later, infection of the forearm was under control by chemotherapy and open reduction of the radius and ulna was carried out. The radius was fixed by a one-eighth inch longitudinal pin without difficulty. Because of the small medullary canal of the ulna, the pin became impacted in the distal fragment. Postoperative x-rays showed that distraction had occurred, making it necessary two weeks later to readjust the pin. Splints were worn only until the soft tissues were healed. Active muscular activity was begun. The radius and ulna show good bony callus after three months. The humerus healing is delayed. There is a small soft callus with some lateral mobility at the fracture site. In this case, the inability to use a substantial pin in the humerus appears to have retarded healing by allowing abnormal lateral mobility of the fracture.

COMMENTS

The contact compression factor ably presented by Eggers, Shindler, and Pomerat[13] is the thesis upon which this investigation has been based. In a recent article, they draw these conclusions:

(1) The contact compression factor should incorporate compression forces into physiological muscle balance.

(2) The presence of contact compression factor favorably

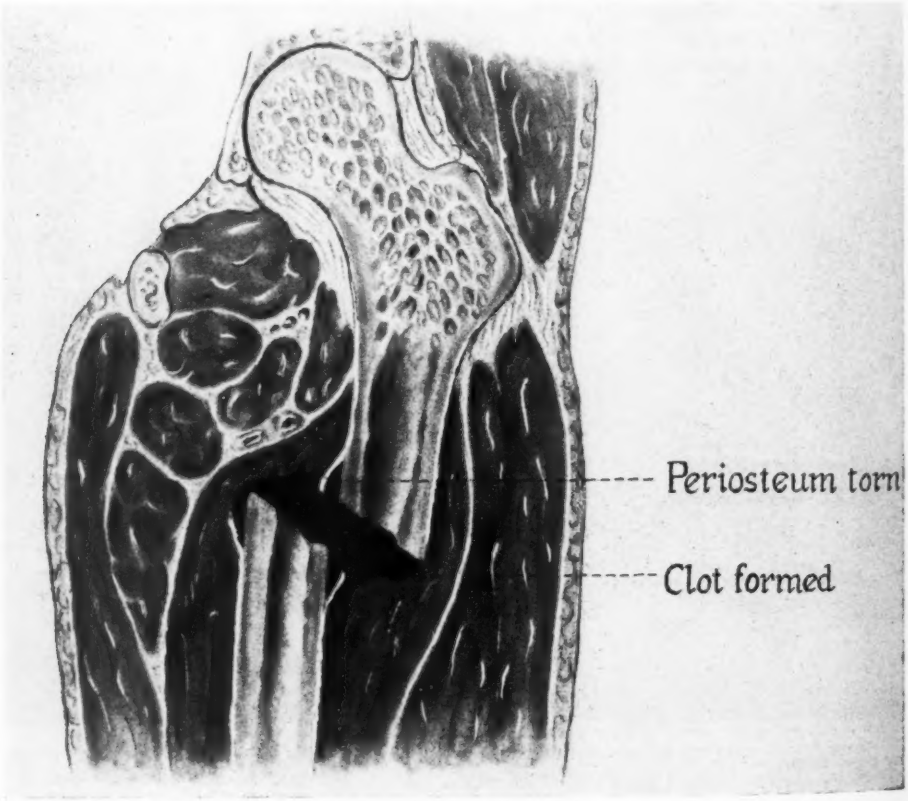

Fig. 5A (See *Fig. 5C* for legend)

influences surgical osteogenesis, and fracture union. Its absence fails to stimulate, but does not prevent osteogenesis.

(3) The presence of infection in the fracture site does not alter the tendency for the osteogenesis to be more active in the area upon which the contact compression factor is exerted.

(4) Excessive pressure causes necrosis of the compressed bone, and lack of pressure fails to stimulate osteogenesis. The most advantageous compression force on the fractured surfaces, apparently, is midway between the extremes, and probably is exerted by the physiological forces of the musculature of the parts involved, to which the osseous structures are adjusted.

Our clinical observations tend to bear out this thesis. Necrosis has not been observed because excessive pressure has not been permitted, the aim being to resume muscular function, not necessarily early weightbearing. Our experience with infection has fortunately been limited, but in the one case reviewed, union did progress at the point of contact compression despite the superimposed infection (*Case 11*).

The importance of distraction as a deterrent to union has long been recognized. To carry the thought a step further, in an amputated extremity, there is little effort toward osteogenesis on the part of nature. In the event of loss of bone substance or marked distraction, the bone ends are rounded over and eburnated just as in the amputated extremity. If contact compression is not the influencing factor, how then does nature distinguish between the amputated extremity and the fractured bone in which the normal process of osteogenesis occurs? The one case of delayed union in fracture of the distal end of the ulna (*Case 12*) is possibly accounted for by the fact that the contact was apparent without real contact compression, there being no important muscles attached to the lower end of the ulna to provide the contact compression factor. In the one case of delayed union in the humerus (*Case 15, Fig. 3*), it is believed that healing was retarded by the necessity for using a pin of such small diameter that fixation was not secure,

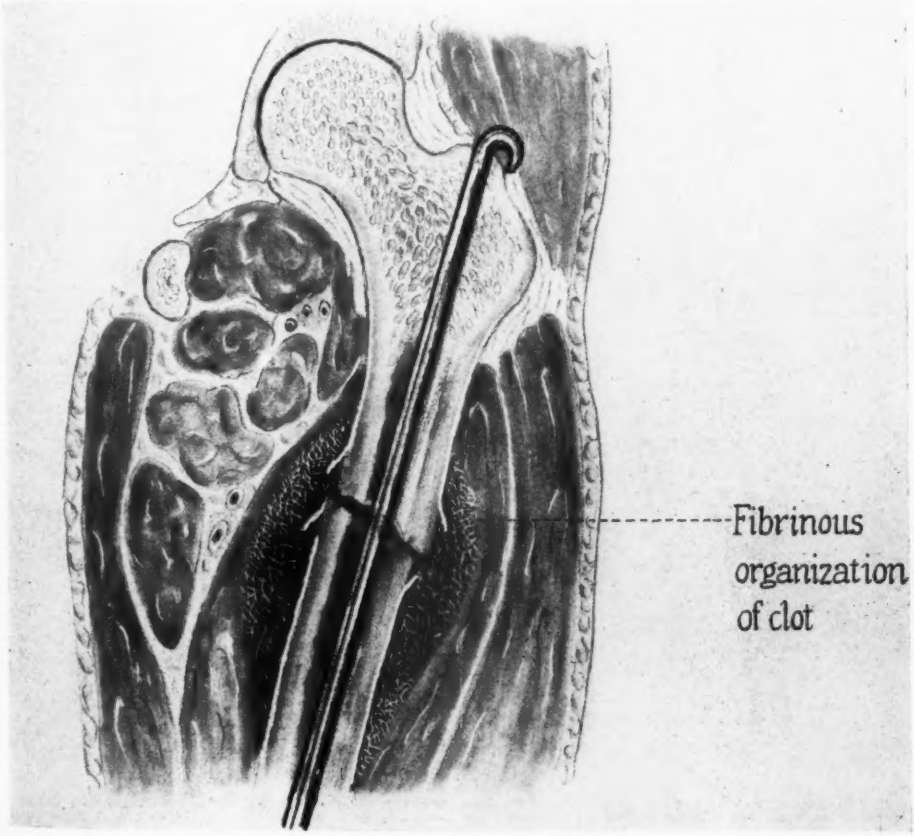

Fig. 5B (See *Fig. 5C* for legend)

allowing continuous angulation of the fracture site.

SECURITY OF FIXATION

It appears that fixation needs to be secure, but not rigid, so that the bone may slide freely upon the pin to assure continuous compression of the bone ends. With longitudinal pin fixation, the security (*Fig. 4*) is based largely upon the three-point pressure principle. Rotation has been a problem in fractures of the tibia only.

Animal experiments of the University of Pennsylvania group (Fitts, Roberts, Spoont, and Ritter[14]) suggest peripheral callus formation as the response to tight pressure within the medullary canal. It has been our purpose to avoid tight fitting objects in the medullary canal. This phenomenon has been observed in those locations where unusually strong spring-type pressure had been exerted in the regions of the head, shaft, or point of the pin. When the pin makes sufficient pressure to cause central necrosis within the bone, there appears to be compensatory peripheral callus formation. Obviously, in such event, the pins should be removed as soon as healing of the fracture is well underway.

It has been observed that callus appears first and most vigorously upon the side of the bone in which the contact compression factor is most evident.

It is apparent that the healing of the bone is

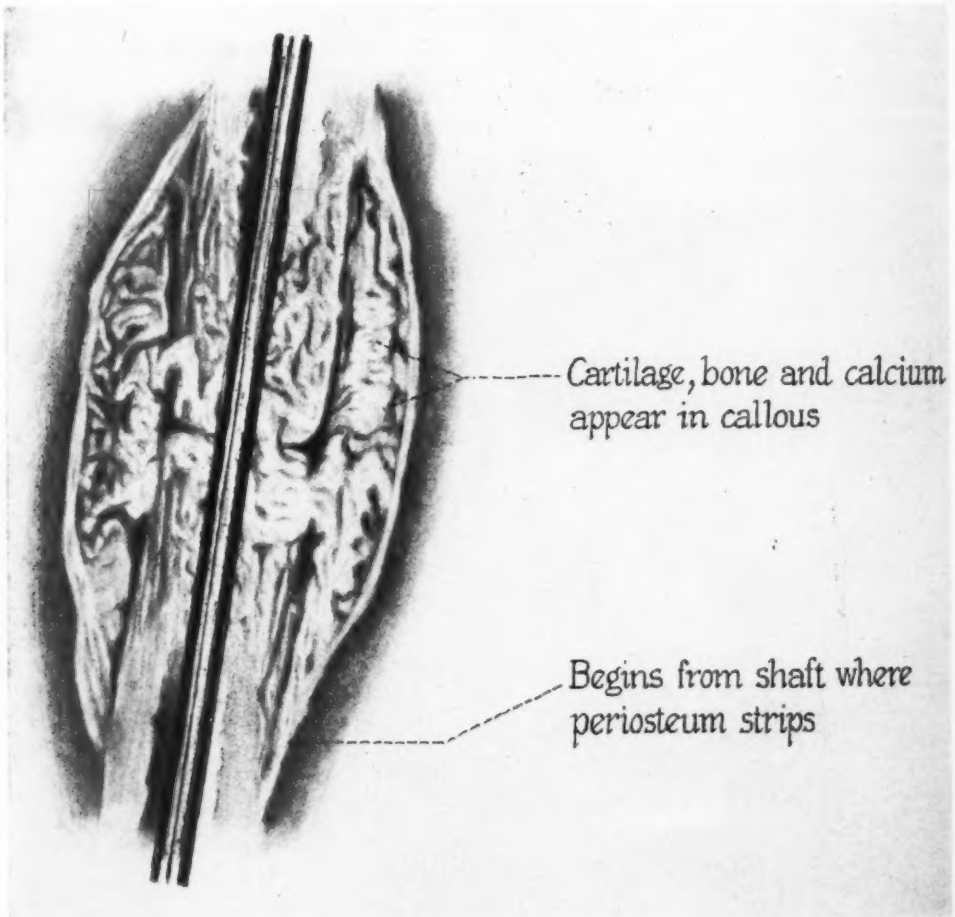

Fig. 5C

Diagrammatic drawings showing that central splinting of the bone encourages peripheral healing of the fractures despite simultaneous absorption of the bone ends. During healing the pin allows the bones to glide so that the physiologic muscle pull of the extremity can provide continuous compression of the bone ends. There is no foreign material between the bone and surrounding soft tissues. The integrity of the medullary canal is maintained. Note how the hooked head grasps the cortex of the bone. Since it projects as a small rounded knob in the tissues it does not interfere with function and produces practically no soft tissue irritation.

essentially a peripheral function (*Figs. 5A, 5B, 5C*). The callus usually begins from the outer side of the shaft of the bone, often at some distance from the fracture, suggesting that central splinting of the bone is physiologic, and that healing will be encouraged by the minimal disturbance of this peripheral healing potential of the bone by minimal surgical trauma, avoidance of periosteal stripping and crippling of the local blood supply to the region, the avoidance of unnecessary drill holes, tight fitting plates, et cetera.

CONCLUSIONS

(1) The mechanics of fixation by the longitudinal pin provides secure, but not rigid fixation, permitting the bone to glide upon the pin to secure the constant contact compression despite bone absorption at the fractured surfaces.

(2) The contact compression factor appears to encourage surgical healing of fractures.

(3) Early muscle function is conducive to contact compression.

(4) Central splinting allows minimal interference in the peripheral healing potential of a bone.

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DISCUSSION (*Abstract*)

Dr. Walter G. Stuck, San Antonio, Tex.—In current surgical journals numerous articles describe intramedullary fixation of fractures and most of them say that this method was invented by Kuntscher in 1940. While it is true that Kuntscher revived the subject, intramedullary pins were first used by Lambotte in 1907 and Hey-Groves in 1919.

The earliest report of the use of intramedullary appliances in this country was made by Rush at a Southern Medical meeting in 1937. As I understand the story, Dr. Rush was sitting in the Central Methodist Church in Meridian one spring morning in 1936 when he dreamed up this method of using a pin in the medulla of a comminuted Monteggia fracture of the forearm. In the past thirteen years he has published many papers elaborating on his further experience.

There are many occasions when intramedullary wires and pins are most useful for immobilizing fractures. I have used wires in the clavicle, radius and ulna, Kuntscher nails in the femur and Rush pins in the tibia and humerus with gratifying success. They are not always easy to insert but they support fracture fragments securely, and are most desirable for holding ununited fractures that have been treated with bone grafts.

I welcome the opportunity to set the record straight upon priority of use of intramedullary fixation in fractures. Dr. Rush presented it to the Southern Medical Association in November, 1937, and Kuntscher's first paper was given before the German Surgical Society in the spring of 1940.

Dr. Dana M. Street, Memphis, Tenn.—Dr. Rush has presented a very clear picture of the mechanical and physiologic principles involved in medullary fixation of fractures. In addition to the general principles of the method, he has given his own variation employing his type of nail, and discussed its advantages.

My own experience has been largely with the diamond-shaped nail in fractures of the femoral shaft, as illustrated in my exhibit. As Dr. Rush said, "We are both trying to get to heaven, but belong to different churches." He speaks of the flexibility of his nail. However, it is not a flexible, flimsy piece of wire. It is a very sturdy nail, and it is my impression that once the nail is snugly sprung into position, not a great deal of bending or springing takes place. If it did, the difference of muscular tension during exercise and while relaxed during sleep would move the fracture sufficiently to interfere with healing, and this has not occurred in Dr. Rush's patients.

In fractures of the forearm, of which I have treated approximately 45 by medullary Kirschner wires, the flexibility of the wires is detrimental, and supplementary cast immobilization is necessary. Dr. Rush's pins are much better, eliminating the need for a cast, but these pins are strong and rigid, filling the medullary canal.

Supracondylar fractures of the femur are an entirely different problem from the shaft fractures. The single axial pin is unsuitable, owing to its poor holding power in the short distal fragment. Here Dr. Rush's contribution is unique. The two pins obtain their hold at widely separated points, providing the maximum stability that the short fragment will allow.

We have used this method in five supracondylar fractures with good results. It was severely tested in two paraplegics in whom the atrophic nature of the cancellous bone, coupled with the fact that the stimulus of weightbearing was absent, tended toward delayed union. A rocking motion in the anterior-posterior plane could be detected for about eight weeks, after which they became solid. A 17-year-old

Negro who began bearing partial weight at three weeks and full at six weeks, made a rapid and uneventful recovery. A compound fracture that became infected has maintained good general alignment, although callus is still absent at 12 weeks.

Dr. Rush (closing).—I should like to call your attention to a small point concerning the open versus the closed pinning of fractures. In the majority of fractures it is better for the patient if the doctor makes an open incision, because, as a rule, he can get by with a minimal incision. In most fractures near joints, we can accomplish our purpose very well without making open incisions. In some of them the open incision is better.

A comminuted fracture at the upper end of the humerus, for example, mostly occurs in elderly persons. Those that we have done by open reduction have been extremely difficult because the fascia was disturbed and we had no splinting by the fascia and muscles once the incision was made.

We found that the pull of the pectoralis major muscle asserts counter action, or the pin counteracts the pull of this pectoralis major muscle, and frequently it is possible to do just a closed reduction, even in a badly fragmented head and neck, passing the pin down through the tuberosity of the humerus; or, in some instances where there is not a substantial enough piece of bone to make the preliminary drill hole, it is possible to pass a pin through a fracture line, just allowing the head to engage the fascia so that it cannot migrate into the bone. Once the pin is in place, there is a three-point pressure exerted, so that as the pectoralis muscle pulls the shaft medially, the pin becomes engaged against the head of the bone, maintaining reduction and giving a fairly rigid fixation.

HEPATIC AMEBIASIS WITH COMPLICATIONS*

By JOHN DAY PEAKE, M.D.
and
MARSHALL ESKRIDGE, M.D.
Mobile, Alabama

The chief purpose of this paper is to emphasize the frequency and importance of liver complications in patients infected with Endamoeba histolytica.

Hepatic amebiasis was not reported frequently in the radiologic literature until recent years. There were no reports in the Year Book of Radiology from 1932 to 1941.[8]

Radiographic examinations, both fluoroscopic and roentgenographic, if done carefully should indicate the diagnosis of hepatic amebiasis in from 80 to 90 per cent of the cases. Ochsner and DeBakey,[1] in a series of 50 cases of amebic liver abscess were able to make positive diagnoses in 87.7 per cent by radiographic examination.

Amebic infection is much more frequent than is generally taught. It is not necessarily a tropical disease. Since the recent war, there has been a considerable increase in the number of cases and also a wider distribution of amebiasis. Craig[2] says that in his opinion that from 5 to 10 per cent of the population of the United States is infected by Endamoeba histolytica. Ochsner and DeBakey[1] in a very extensive review of amebiasis find some authorities reporting 20 per cent infected. In other words, in the United States probably ten to thirty million are infected with Endamoeba histolytica and of these, one million have amebic hepatitis. Ochsner and DeBakey[1] in reviewing the fatal cases of amebic infection say that 36.6 per cent were found to have liver abscess. It is well accepted that there are a number of patients with amebic hepatitis who never progress to abscess formation.

Endamoeba histolytica is found in the stools of only 10 to 70 per cent of patients who have amebic abscess. Aspirated chocolate pus from the liver abscess cavities, when examined, is often negative for ameba. In the walls of the abscess cavity one is more apt to demonstrate the ameba.

The amebas reach the liver by the portal vein, lymphatics or directly through the peritoneal cavity. The commonest route is through the portal vein. The right lobe of the liver is most often involved and may have one or more abscess cavities. The majority of these cavities are in the dome of the liver. The venous drainage from the colon goes chiefly to the right lobe of the liver thus accounting for the increased involvement by Endamoeba histolytica in the right lobe of the liver.

The onset of hepatic amebiasis may be acute. Cases have been reported as early as one week after the acute diarrhea symptoms. Usually it is a slowly progressive process, sometimes as much as 10 to 15 years after the primary infection. Diarrhea is not necessarily a constant finding. Some patients actually have constipation. The acute symptoms in liver abscess can be confused with acute gallbladder disease, acute pancreatitis and perforation of appendix or peptic ulcer. The chronic symptoms can be confused with chronic appendicitis, chronic gallbladder disease, carcinoma of the liver, carcinoma of the pancreas, carcinoma of the stomach, pancreatic cyst, cirrhosis of the liver, amyloid diseases of the liver, echinococcus cyst. The pulmonary symptoms can be confused with basal pneumonia,

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basal pleurisy, empyema, pleural effusion and basal infarction.

The commonest symptoms are liver pain with tenderness, fever, diarrhea, chills, nausea, vomiting and jaundice. If the symptoms are slow in progressing, there is usually marked loss in weight. On physical examination there is a large liver, generalized abdominal tenderness with some rigidity in the right upper quadrant and often findings in the base of the right lung. There is usually a moderate degree of fever with some increase in pulse and respiration. After the patient has been sick for a long period of time there are numerous physical findings, depending on the complication and usually a very toxic patient. There is moderate leukocytosis and, if secondarily infected, some increase in the polymorphonuclear count; the stool is positive for Endamoeba hystolytica in probably 15 to 70 per cent of cases. The complement fixation test is a worth-while procedure according to Craig.[2]

Most authorities including Ochsner and DeBakey[1] emphasize radiographic examinations as being the most dependable diagnostic procedure in the diagnosis of hepatic amebiasis. The only methods that are more dependable than the radiographic examination are direct demonstration of the ameba in pus drawn from an abscess cavity, and demonstration of the abscess surgically.

The radiologic findings are: elevation of the right diaphragm, occasionally elevation of the left diaphragm if there is an abscess in the left lobe, fixation of the right diaphragm, particularly if the abscess is near the dome, obliteration of the cardiophrenic angle, enlarged tender liver, right basal pulmonary abnormality, probably with some patchy pneumonitis, atelectasis or fluid (Pancoast[6]), and bulging diaphragm if the abscess is pointed (Granger[3]). Miles[4] suggested filling the stomach and duodenal bulb with barium; if an abscess is present, the cap and cardia are displaced and the lesser curvature assumes the typical crescent shape. Aspirating the abscess cavity and replacing with air followed by radiographic study is a worth-while procedure. Others suggest using opaque media rather than air in the abscess cavity. Reeves and Youngstrom[5] mentioned the use of "thoratrast" to demonstrate the liver and spleen; this was mentioned only once and we believe that with the known complications, this drug should be condemned for the usual study. Serial examinations of the chest are most important as often one can watch the process develop, and following antiamebic treatment, watch the diaphragm and right basal pulmonary abnormalities subside.

Ochsner[1] and his workers feel that patients should be treated before suppuration develops in the liver. If a patient is found to have characteristic x-ray and clinical findings of amebic hepatitis even in the presence of negative stools, treatment is suggested. It is believed that by this method, patients will be saved a considerable amount of time and that innumerable lives may be saved.

Case 1.—A white physician, age 51, was brought to the hospital January 9, 1943. The patient had been ill at home two days before admission to the hospital with chills, fever, nausea, and vomiting, without definite pain. There were no previous attacks. His past history was essentially normal, with no history of diarrhea. The patient had never lived in the tropics. He was thought to have malaria on admission as there was an old indefinite history of malaria in the past.

The patient was well nourished, acutely ill, temperature 102.3° F.; pulse 80; respiration 16; blood pressure 150/80. There was some abdominal distention and tenderness, probably a little more marked in the upper right quadrant. The remainder of the physical examination was essentially normal.

Repeated smears for malaria were negative. The red blood cell count was 4,160,000; white blood cell count 12,750; hemoglobin was 78 per cent; polymorphonuclears 69 per cent; small lymphocytes were 18 per cent; eosinophils 6 per cent; large monocytes 5 per cent; myelocytes 2 per cent. Stools showed considerable pus and blood but no parasites or amebas. The urine was essentially negative, and agglutinations for the typhoid group were negative. Widal, Weil-Felix, Brucella abortus, Para A and B tests were negative. Repeated blood counts showed the white cell count to vary from 12,000 to 20,000. Repeated urine examinations were negative. Numerous stool examinations were negative. The icterus index was 2.25. There was no change in the differential count. The Weil-Felix test was positive in all dilutions. Lumbar puncture was done; the fluid was negative and there was no increased pressure.

The temperature varied from 99 to 104° F. The patient was put upon antimalaria drugs with relatively no results. Supportive treatment, sedatives and salicylates, sulfaguanidine, and several blood transfusions were given and the patient was fortified with vitamins. Colonic irrigations with normal saline were employed. In spite of the treatment there was little change in the patient's symptoms. After he had been in the hospital for two days, we x-rayed the chest and at that time there was no pulmonary or cardiac abnormality. The diaphragms were clear. After we had observed the patient for 29 days, and kept him on supportive treatment, it was decided to try an x-ray survey of the gastro-intestinal tract.

After a complete survey of the gastro-intestinal tract including study of the diaphragms, a summary of this survey showed definite elevation of the right diaphragm with a small amount of fluid in the right costophrenic angle with decreased excursion of the diaphragm. The heart and lungs were normal, and the remainder of the gastro-intestinal study was essentially normal. The liver was not grossly

enlarged downward. The gallbladder functioned. With the clinical course and the x-ray findings, a diagnosis of probable hepatic amebiasis with secondary pulmonary changes was established. During the stay in the hospital, the patient lost 43 pounds, continued to have chills and fever and general abdominal discomfort with occasional diarrhea. The patient was transferred to another hospital on February 11, 1943, a little over a month after admission. A diagnosis of amebic hepatitis was confirmed and the patient was put on grain 1 of emetine hydrochloride daily and after 3 days his temperature had fallen to normal and he began to improve. After 12 doses of emetine hydrochloride, the patient was symptom free and returned home. He was given "diodoquin" to be taken at home and at intervals since 1943 has taken "diodoquin" but has never had a recurrence of the original trouble.

Case 2.—G. B. M., a white man, age 57, was brought to the hospital April 4, 1949. In February, 1949, the patient had an almost complete thyroidectomy and, following the operation, began to run fever of an irregular type. Rales were heard in the base of the right lung.

The red blood cell count was 4,010,000; white blood cell count 37,000; lymphocytes 3 per cent, polymorphonuclears 86 per cent, and stabs 11. Hemoglobin was 84.5 per cent (13 grams); and the urine was negative. One specimen of stool showed no amebas. Gallbladder examination revealed a nonfunctioning gallbladder. April 4, 1949, a chest film revealed an elevated right diaphragm to the level of the fourth rib anteriorly, no gross pulmonary lesion, and prominence of the heart. A film over the kidney, ureter and bladder region revealed gas in the colon, psoas muscles clear, and kidney outline normal. The liver and spleen were clear, not enlarged. The bones showed hypertrophic changes. The impression was of probable subdiaphragmatic abscess, liver abscess to be considered.

After the question of liver abscess arose, it was considered advisable to treat this patient as amebic hepatitis or amebic abscess with emetine hydrochloride. Beginning April 5, 1949, grain 1 of emetine hydrochloride was given daily for 8 days. The patient was put on supportive treatment and after 5 days was greatly improved, discharged from the hospital and continued treatment at home.

Case 3.—C. M., a white man, age 49, was first seen at home at which time a diagnosis of influenza with bronchial pneumonia was made, the pneumonia being in the right base. At this time there was no enlargement of the liver and no tenderness in the area of the liver. The patient did not respond to antibiotic and other antiseptic therapy and after 10 days was transferred to the hospital.

X-ray of the chest at that time revealed a probable early or resolving pneumonitis in the right base. The right diaphragm was very slightly elevated at that time, but it was not thought to be elevated enough to be pathologic. After a short period of time, the patient was discharged from the hospital. His sickness had not entirely disappeared, but was somewhat improved. After returning home he became progressively worse and was readmitted to the hospital. X-ray of the chest at this time revealed a marked elevation of the right diaphragm with some enlargement and considerable tenderness of the liver. He failed to respond to antibiotic and sulfa therapy, and was given emetine hydrochloride grain 1 daily for a period of 8 days with dramatic and prompt disappearance of all symptoms. The liver became normal in size, the temperature returned to normal, there was no tenderness in the right upper abdomen and the patient experienced for the first time marked relief of discomfort and a complete sense of well being. The patient was advised to take "diodoquin" tablets by mouth and has remained well since.

Case 4.—E. F., a colored man, age 19, termite exterminator, was admitted to the hospital December 13, 1948, with a chief complaint of pain in the stomach. For the preceding week or ten days he had pain in the right upper quadrant and anorexia. There was no cough, vomiting, jaundice or

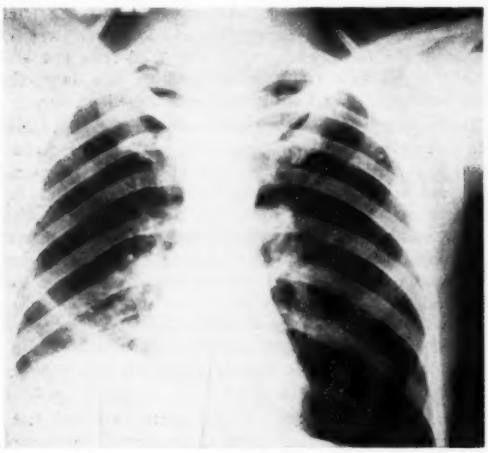

Fig. 1A, Case 2

Elevated, partially fixed right diaphragm with right basal pneumonitis (hepatic amebiasis without definite suppuration). Recovery following emetine.

Fig. 1B, Case 2

Elevated, partially fixed right diaphragm with right basal pneumonitis (hepatic amebiasis without definite suppuration). Recovery following emetine.

diarrhea. The day before admission, the pain became severe and he developed a hot fever, so he came to the emergency room and was admitted. The remainder of the history was noncontributory.

The patient was a well-developed, well-nourished, colored male in severe pain. The temperature was 103.4° F.; pulse 100; respiration 22. Findings of interest were rigidity and tenderness in the right side of the abdomen; the liver was enlarged two finger-breadths below the costal margin, and was smooth and tender.

The white blood cell count was 19,000; polymorphonuclears were 90 per cent; lymphocytes 8 per cent; myelocytes 2 per cent; sedimentation rate 42 mm. in one hour. X-rays of the chest were essentially negative, and the abdomen showed probable enlargement of the liver.

The second hospital day the physical findings were those of a perforating ulcer or appendix. An abdominal exploration was carried out through an upper right paramedian incision. There was an injected gastro-intestinal tract with dilatation of the entire large bowel and appendix with gas, an enlarged, firm liver with the lower border of the right lobe at the level of the umbilicus. The appendix was removed and showed minimal inflammatory changes under the microscope. The next 10 days the patient ran a septic temperature which was not controlled by pencillin, streptomycin and supportive treatment. Patient was in an oxygen tent most of the time and very ill. The white blood cell remained around 20,000 with 94 per cent polymorphonuclears. Agglutinations for paratyphoid, typhoid, Brucella abortus, and proteus X 19 were all negative. During the next 20 days the temperature gradually decreased, the patient improved clinically, and x-ray of the chest showed fluid, pleural thickening and pneumonitis on the right side which was thought to have originated from a liver abscess. January 11, 1949, thoracentesis was done and 800 cc. of creamy, cloudy fluid containing small bits of tissue was obtained. The next day 850 cc. of similar fluid was obtained. On January 17, 1949, the complement fixation test for amebiasis was reported positive for the specimen collected December 21, 1948. The stools had all been negative for ameba, but on January 17, 1949, material obtained through the proctoscope was positive for Endamoeba histolytica cysts. Emetine hydrochloride was started January 18, 1949, grain 1 intramuscularly daily for 7 days. On January 24, 1949, "diodoquin" tablets 1 three times a day for 21 days was started. Culture of the fluid from the liver showed no growth and the patient improved rapidly upon antiamebic treatment with occasional thoracentesis.

On February 24, 1949, 600 cc. of straw-colored fluid was removed and on March 4, 1949, 150 cc. was removed. The patient appeared to be almost completely well clinically and was discharged March 5, 1949 at his own request. Since then he has been followed in the clinic and has made a complete recovery except for residual pleural thickening in the right base.

Case 5.—W. H., a white man, age 40, machinist helper, was admitted to the hospital January 10, 1949. His chief complaint was pain in the left side of the abdomen of two weeks duration. Illness began with upper respiratory infection for a week with pain in the left side of chest and nonproductive cough. The bowels were regular, and there was no diarrhea.

The temperature was 101.6° F.; pulse 120; respiration 40. The patient was a well-developed, well-nourished white man with moderate dyspnea but not in acute distress. Dullness and decreased breath sounds were noted over both bases, and the liver was palpated two finger-breadths below the costal margin. There was moderate bulging in the right flank with tenderness in the costovertebral angle.

The white blood cell count was 34,500; polymorphonuclears were 96 per cent; lymphocytes 4 per cent; and urine contained 1 plus albumin.

X-ray of the chest and abdomen showed elevation of the

Fig. 2A, Case 5

Elevated right diaphragm, obliteration of costo- and cardiophrenic angles, basal pneumonitis, small amount of fluid (amebic abscess).

Fig. 2B, Case 5

Following aspiration of the abscess cavity and installation of air, a large liver abscess was demonstrated, with Endamoeba histolytica. Open drainage and emetine were employed with satisfactory recovery.

right leaf of the diaphragm which was thought to be due to fluid trapped beneath the base of the lung. Two days later, chest x-ray showed a meniscus along the lateral chest wall. Thoracentesis was done and 600 cc. of brownish, moderately thick pus was removed. Smear and culture showed no organisms. Examination of the stool was negative. Two days later 300 cc. more pus was removed and 150 cc. of air was instilled into the cavity. Films of the upper abdomen and lower chest outlined a huge subdiaphragmatic abscess with extension and communication with the right pleural cavity. On January 17, 1949, extra peritoneal drainage was done through a small right anterior lateral incision along the lower border of the twelfth rib. About 1,500 cc. of creamy white pus was aspirated. There was a necrotic area in the upper aspect of the right lobe of the liver which communicated with the subphrenic space. Biopsy of the walls showed hemorrhagic material and purulent exudate but no evidence of ameba. The complement fixation test for amebiasis on blood collected at this time was later reported positive. Emetine hydrochloride grain 1 daily for 10 days was started. The patient's temperature spiked to 100° F. until the fifth postoperative day when it became normal. By the twenty-first postoperative day, drainage had ceased and the patient was much improved. "Diodoquin" was started. The patient was discharged on the twenty-ninth postoperative day which was the thirty-sixth day after admission, well on the road to recovery. A chest film at discharge showed some infiltration and pleural thickening in the right base.

Case 6.—J. W., a white man, age 46, was admitted to the hospital January 3, 1949. Immediately following a minor injury to the shoulder around Christmas time, the patient began to have pain in the back which progressively became worse. There had been some bloody diarrhea, hematuria, nausea, vomiting and later chest pain. All symptoms had progressed considerably within the previous few days. The past history was nonessential.

His temperature was 102° F.; pulse 90; respiration 26; blood pressure 170/70. He was slightly obese, actually ill, and in moderately severe pain, especially on motion. Decreased breath sounds were heard over the right lower lung fields with loud friction rubs. Otherwise, the heart and lungs revealed no abnormality. There was diffuse tenderness in the right upper quadrant of the abdomen and right lumbar region. The remainder of the abdomen revealed no abnormality; in fact, the remainder of the physical was essentially normal.

The red blood cell count was 4,500,000; white blood cell count 14,000; hemoglobin 80 per cent; polymorphonuclears 83 per cent; small monocytes 15 per cent, and eosinophils 2 per cent. Routine urine examination was essentially negative. A scout x-ray film of the abdomen was essentially normal; a film of the chest showed definite elevation of the right diaphragm. Later, there was some patchy pneumonitis in the bases of both lungs.

At first, it was felt that the patient had a right basal pleurisy with severe gastro-intestinal enteritis. The possibility of perforated viscus or mesenteric thrombosis was considered.

He was placed on an expectant type of treatment, nothing by mouth, close observation and study of the stools, urine, chest films, glucose by vein, and 50,000 units of penicillin every six hours. He was transferred to surgery January 6, 1949, three days after admission, with a tentative diagnosis of liver abscess. Laparotomy was performed. The gross findings at surgery revealed an elevated right diaphragm with enlarged liver. Straw-colored fluid was found in the peritoneal cavity on opening, and this was followed by approximately 1,000 cc. of pus. On exploring the abdomen, it was found that the entire right lobe of the liver was involved in a massive abscess cavity measuring 12 x 10 cm. Two drains were left in the abscess cavity, 1 drain in a stab wound in the flank. The abdominal wall was closed. The patient's course continued to be critical. He lost considerable weight, became more anemic and markedly toxic. The red blood cell was 3,100,000. Penicillin was given following operation, with glucose and supportive treatment. The stools were checked during this time and Endamoeba histolytica was demonstrated January 8, 1949. January 9, 1949, the first dose of emetine hydrochloride was started, grain 1 daily for 6 days. On January 16, 1949, "sulfasuxidine" was given. On January 17, 1949, a fecal fistula developed from which Endamoeba histolytica was demonstrated. The patient for a period of time improved and was ambulatory, but slowly and progressively grew worse and died February 10, 1949, probably from liver failure.

Necropsy.—The weight was approximately 120 pounds; and height five feet, six inches. There was a healed transverse abdominal incision of the right upper quadrant, and a stab wound fistula connecting the colon and right flank. The peritoneum was adherent to the entire colon and the cecum to the sigmoid. Slight pressure caused the large bowel to slit, showing that it was necrotic throughout except where it was adherent to the right lobe of the liver, where there was a fecal fistula opening to the outside. The entire mucosa was necrotic without any definite areas of ulceration. The small bowel and stomach appeared relatively normal. The right lobe of the liver had been practically destroyed with a huge necrotic mass which communicated with the fecal fistula. On section of the mid portion of the right lobe, thick, yellow pus exuded and there was only a remaining shell of the liver substance covering the huge abscess cavity which involved the entire right lobe of the liver. The gallbladder was intact. The pancreas was firm and uninvolved. The lungs were not adherent, both upper lobes were firm, bluish in color and showed a moderate amount of air. There were no areas of consolidation. The heart was relatively normal; with approximately 100 cc. of pericardial fluid. The coronary vessels and valves were normal. The kidneys were normal in size; the capsules stripped with some difficulty; there was no hydronephrosis.

Summary.—Passive pulmonary congestion is noted, with areas of focal necrosis in the lungs, and passive congestion in the spleen. The intestinal tract shows extensive colitis (amebic), peritonitis is generalized, there is a massive liver abscess (amebic), and moderate pyonephrosis.

Case 7.—M. S., a white man, age 32, radio operator, was admitted to the hospital March 17, 1949, discharged March 31, 1949 and readmitted April 1, 1949. He was admitted with a chief complaint of pain in the right upper quadrant.

The patient was well until five days previously when he began to have pain in the right upper quadrant and

epigastrium, colicky in nature, with some nausea and vomiting. The stools were light colored but there was no diarrhea and no jaundice. He had chills and fever for several days and during the preceding few hours had pain in the right shoulder. Of interest in the past history is that the patient was a chronic alcoholic for a number of years but had abstained for the previous four months.

His temperature was 103° F.; pulse 105; respiration 26; he was a well-developed, well-nourished white man in acute distress. The skin showed a slightly yellowish tint. There was tenderness in the right upper quadrant; the liver was palpated 2 cm. below the right costal margin. Its border was smooth, firm and tender. There was no rigidity or distention and bowel sounds were normal to hyperactive. The extremities were cold and sweaty. An upright film of the abdomen and chest showed an area of minimal infiltration in the left base.

There were 3,006,000 red blood cells; 12.75 grams of hemoglobin or 74 per cent; white blood cells 29,750; polymorphonuclears 85 per cent; stabs 7; juveniles 3; and lymphocytes 5 per cent.

The patient was started upon pencillin and supportive treatment. The next day the abdomen was explored through a right upper rectus incision with no positive findings. The liver was thought to be within normal limits for size, color and consistency. Subsequently the patient ran a septic temperature spiking to 103.2° F., had considerable abdominal distention and was generally very ill and toxic. Supportive treatment consisted of whole blood, vitamins, sedation, penicillin, streptomycin and Wangensteen suction. The temperature gradually subsided but spiked almost daily to 101° F. On the twelfth postoperative day the patient was still in poor condition, but was discharged because of the family's insistence. He was readmitted the next morning with an increase in abdominal pain. Physical examination showed an acutely ill white man with a jaundiced appearance and in mild shock. The heart action was rapid and weak and the abdomen was distended. His temperature was 98.6° F.; pulse 118; respiration 40; agglutinations and all the laboratory work were negative except for a leukocytosis of 12,000; polymorphonuclears were 79 per cent and lymphocytes 14 per cent.

Next day an intravenous pyelogram and a chest film

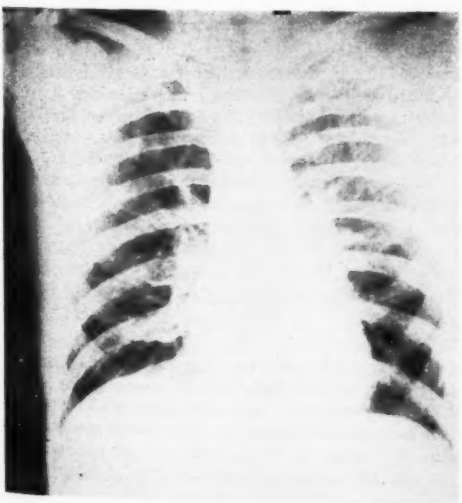

Fig. 3A, Case 7
Original chest essentially normal.

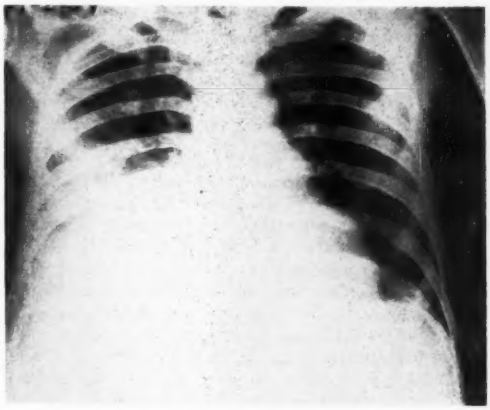

Fig. 3B, Case 7
Considerable enlargement of the liver with elevation of the right diaphragm, obliteration of costo- and cardiophrenic angles, basal pneumonitis with fluid lower right thorax. Open drainage, emetine was given late, patient died from generalized peritonitis secondary to amebic liver abscess.

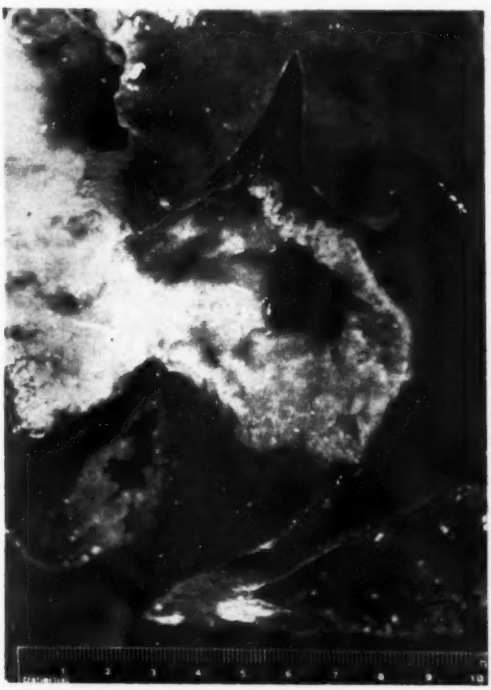

Fig. 3C, Case 7
Pathologic specimen showing extensive abscesses with almost complete destruction of liver.

showed no gross abnormality in the urinary tract. There was enlargement of the liver with elevation of the right leaf of the diaphragm and infiltration in both bases. The impression was of subdiaphragmatic abscess or liver abscess. The patient stayed in low grade shock for the next 2 days and after a circulatory collapse April 4, 1949, venesection with administration of blood and plasma was required. After this, a needle was inserted into the liver and 1,150 cc. of thick, greyish fluid was removed. Direct smear showed large numbers of motile Endamoeba histolytica. Emetine hydrochloride was started. Taps the next three days were productive of about 250 cc. of similar fluid. The patient appeared to improve clinically, but on April 7, 1949, he suddenly went into profound shock and expired.

Post Mortem Data.—Upon opening the peritoneal cavity approximately 2 liters of fecal smelling, brown, watery material was seen to lie in the peritoneal cavity. Loops of small and large intestines were bound together by friable fibrinous adhesions. The cecum showed complete autolysis of the anterior surface and fecal material lay free in the right lower quadrant. The liver was 4 cm. below the costal margin. The surface was blackish purple in color over approximately two-thirds of the right lobe. The left lobe was covered with a yellow fibrinous exudate. The surface of the liver over the right lobe was well sealed off by the diaphragm which was elevated. The spleen was enlarged; the appendix showed complete dissolution. In the thorax approximately 350 cc. of dark amber fluid could be seen in either pleural cavity. There was an area of pneumonitis in the left lower lobe. The liver weighed 4,000 gms. and approximately two-thirds of its parenchyma consisted of cavities which appeared well defined at their margins. These margins were formed by yellow, necrotic friable tissue; the anterior portions of the cavities contained a clay-colored grey liquid. In several of the cavities there was reddish brown liquid with irregular clots of friable tissue. This was confined to the right lobe. The left lobe showed no significant changes. The cecum showed complete autolysis of its anterior surface. At the hepatic flexure there were 30 or 40 ulcerated areas in the wall. These were well defined with red margins and yellow central portions. On cross section, they presented a typical water bottle appearance with narrow necks and wide deeper portions. These ulcers were seen in the transverse colon and to a lesser degree in the descending colon. Four ulcers were seen in the rectum and rectosigmoid, each measuring from 1 to 3 cm. in diameter. Microscopic section of the lesion in the left lower lobe showed the air space to contain abundant granular necrotic material in which lay innumerable large macrophages containing debris and well-preserved erythrocytes. The former presented large vesicular nuclei and presumably represented trophozoite forms of Endamoeba histolytica. Sections of the liver showed necrotic debris with amebas in the trophozoite stage. Similar findings were noted in the large intestines. The case was interpreted as one of amebiasis due to Endamoeba histolytica with ulceration, perforation and dissolution of the cecum and generalized peritonitis. The relationship of the amebic abscess of the liver and the granuloma of the lungs to the course of the illness remains undetermined. Death was attributed to generalized peritonitis following dissolution of the cecum.

CONCLUSION

In our cases those patients who were diagnosed early and treated, recovered without complications. Those who developed suppuration of the liver with complications were extremely ill and the mortality was high. We realize that the propriety of treatment of early hepatitis with negative stools is questioned; however, with positive x-ray findings and with the typical clinical course, one can be well satisfied with the diagnosis of hepatic amebiasis. It is probably done with much more exactness than numerous other conditions that are treated. We feel that it is a responsibility of the radiologist to emphasize early diagnosis and thus permit the physician in charge to start specific antiamebic therapy early.

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DISCUSSION (*Abstract*)

Dr. David Shapiro, Louisville, Ky.—This paper has emphasized certain pertinent facts which should lead to a diagnosis of amebic liver disease. It is not generally realized that amebic liver abscess is the commonest complication of amebic dysentery.

In 1934, Craig, who has written extensively on this subject, found only a 5 per cent incidence, which is rather surprising; but Woodward, who over many years collected a very large series of 3,680 autopsy cases from the British colonies, found a 21 per cent incidence. Again, a 21 per cent incidence of amebic abscess was found by Councilman and Lafleur. A more recent study by Isaac in 1945 reported a 14 per cent incidence in 222 cases of amebic dysentery. These were cases seen in American military personnel during World War II.

Hence, amebic hepatitis is not at all a rare disease; and it should certainly be thought of as a cause of obscure fever with liver signs.

It is important to point out that only about 60 per cent of patients with proved amebic liver disease give a history of dysentery; or, what is more significant, some 40 per cent of patients with amebic hepatitis do not give a history of dysentery at all. So the episode of liver disease in this 40 per cent group, who give no history of dysentery at all

but who have their initial complaints referred to the liver, would certainly appear to be of obscure or unknown etiology.

Pathologically, there are two stages of the disease. There is a diffuse amebic hepatitis, and there is a frank amebic abscess.

Differentiation of these two stages is not always possible clinically, so many people do not try to distinguish between them because, if there is any indication that there is amebic hepatitis, certainly therapy is not withheld in order to make a differentiation.

The diffuse hepatitis is similar to hepatitis of any other origin, except for one feature; as a rule, jaundice does not occur in amebic hepatitis and, commonly, it does in other cases of hepatitis.

These cases of diffuse hepatitis show either no positive x-ray signs, or only a downward displacement of the liver edge. The diagnosis is dependent upon a careful history, suggestive physical signs and, certainly, a therapeutic test to emetine.

Coming to the stage of frank or gross abscess, which may be multilocular, as has been pointed out by Dr. Peake, there are positive x-ray findings in almost 90 per cent of cases. In the seven cases shown by Dr. Peake today, every case had some abnormal roentgen findings and in all five of my own cases there were abnormal roentgen findings. For whatever this small series of twelve is worth, we are certainly batting 100 per cent.

The commonest seat of the abscess is in the upper and posterior portion of the right lobe; hence, the usual enlargement of the liver upward, and the right diaphragmatic leaf moving up with it. This would explain the abnormal roentgen signs of the diaphragm, and the secondary pleuropulmonary involvement, which have already been amply demonstrated in the paper.

The small group of cases, the 10 per cent in which we get no roentgen signs, we explain by the fact that the abscess is situated in the center of the liver substance, with no involvement of its surface so that no diaphragmatic or other significant changes result.

Dr. Peake said that only about 10 per cent of cases of amebic hepatitis show positive stools. According to Elsom about 50 per cent of cases with amebic hepatitis have positive stool examinations. Hence, with a 90 per cent incidence of abnormal roentgen findings in the gross liver abscess, and only about a 50 per cent incidence of positive stool in such cases, it appears that the roentgen examination certainly is more significant than the stool examination.

Furthermore, the roentgen demonstration of colonic amebiasis, although extremely helpful when found, is not at all a prerequisite to hepatic involvement.

It is interesting to note, as pointed out by Manson-Bahr, that, unlike the echinococcus cyst of the liver, which often shows calcification in the walls of the cyst, calcification in the wall of a chronic amebic abscess is rare. Also, the "echinococcus foam" sign (due to daughter cysts floating on the fluid surface) seen in cases of suppurative hydatid cyst of the liver is not seen in amebic abscess.

Elevation of the right dome of the diaphragm is not only the most unequivocal sign of amebic abscess, but it is most valuable in checking upon therapeutic results. Usually, while the clinical response to specific therapy may be dramatic, as shown to you by one or two of these cases, the x-ray signs will be considerably slower in returning to normal.

In one of our own cases, the right leaf of the diaphragm was elevated at least two intercostal spaces. The patient made a dramatic response; yet the diaphragm never did return to its normal level.

A word of caution: I am sure most of you here are aware of it, but we have seen some of the younger men describe the antero-median bulge of the right dome of the diaphragm as possibly due to liver abscess or tumor. That the bulge is not due to a liver lesion can be easily shown by studying the patient fluoroscopically. In deep expiration the bulge disappears, or certainly becomes less obvious. The diaphragmatic elevation or bulging in amebic liver abscess, such as described today, should be a constant finding.

As to the use of "thorotrast." This is a radioactive substance of very long half life, and is an alpha emitter only. Little or none of this substance is excreted by the body after injection. It appears to be selectively absorbed by the reticulo-endothelial system. Although its radiobiology has not yet been completely worked out, its ionizing power is great at extremely short range. Theoretically it appears that "thorotrast" may be dangerous, but actually only a few cases have been reported in which sarcoma of the liver followed "thorotrast" injection years later. The risk appears somewhat of the same order of possibility as sarcoma of the bone developing after proper external irradiation to a soft tissue malignancy overlying that bone.

As the situation appears at this time, I believe "thorotrast" still has a place in the study of selected cases of obscure liver disease. The damaged reticulo-endothelial cells in the liver abscess will not absorb it, and routine films or laminograms may definitely show the site of disease. So, although its use entails a small calculated risk, this may be offset since it furnishes diagnostic information in a very obscure case, without which information the patient may run a greater risk.

From a roentgenologic point of view, the most important element for diagnosis of amebic liver abscess is a high index of suspicion. If you suspect it, then there will be, as a rule, confirmatory signs.

Dr. Robert J. Reeves, Durham, N. C.—These cases should be diagnosed early and operated upon before they break through into the thorax. In our first report, in 1932, we studied sixty cases with "thorotrast." Many of these have come back through the years since. We have one in the hospital now. One came back with a perforated peptic ulcer. Our medical men have done all the liver studies, including multiple liver biopsies; and he is perfectly normal now so far as they can tell. His liver sixteen years later is normally functioning, so I think "thorotrast" is an aid for early localization of these abscesses.

Dr. Peake (closing).—We have had no experience with "thorotrast." We have been warned so much against it in the literature and at meetings in the past few years that we are still skeptical. I should not want it used on me personally.

THE TREATMENT OF AMEBIASIS WITH AUREOMYCIN*

By Leon V. McVay, Jr., M.D.
Raymond L. Laird, PhD.
and
Douglas H. Sprunt, M.D.
Memphis, Tennessee

In the spring of 1949, it was decided to investigate the action of aureomycin, a recently developed antibiotic, in the treatment of amebiasis. There were several reasons for embarking upon this project. While using aureomycin in the treatment of various infections,[1] we had observed a change in the gross character of the stools, and microscopic examination had revealed an alteration in the fecal bacterial flora. In addition to this evidence of a local intestinal action, we had already demonstrated a systemic effect with the attainment of high blood levels following the oral administration of aureomycin. Furthermore, it was felt that there was definite need for an improvement in the treatment of amebiasis.

Amebiasis, or human infection by the protozoan parasite Endamoeba histolytica, is a world-wide and prevalent infection. While it is more common in tropical areas, its over-all incidence in the United States is said to be approximately 5 to 10 per cent.[2] With the recent advent of improved laboratory methods, the frequency and importance of this infection in the United States is being increasingly recognized. However, its diagnosis and treatment have remained unsatisfactory.

Many of the commonly used amebicidal preparations are potentially quite toxic. This is especially true of emetine which is used in the relief of symptoms in dysentery, hepatitis, and abscess due to Endamoeba histolytica. Emetine, either as the hydrochloride for parenteral use or as the bismuth iodide for oral administration, is contraindicated in young children, in pregnant women, and in those with cardiorenal disease. Even if the patient receiving emetine is apparently healthy, he should be kept at absolute bed rest; the blood pressure and pulse rate should be carefully observed; and if possible, serial electrocardiographic tracings should be obtained because this drug has a cumulative effect and may be quite toxic to the cardiac musculature. The cystic forms of Endamoeba histolytica are not destroyed by therapeutic levels of emetine; and, therefore, another amebicidal preparation must be given simultaneously or immediately subsequent to its use. Numerous arsenic and iodine compounds are used as anti-amebic agents. These preparations carry with them, in varying degree, the toxic potentialities of the heavy metals from which they are derived. The multiplicity of amebicidal agents in common use bears witness to the inadequacy of all. It may be necessary to resort to all known forms of therapy in the resistant cases. For the routine treatment of acute amebic colitis, Bockus[3] recommends beginning with a course of emetine, following immediately with a course of carbarsone, and terminating with a course of one of the iodine compounds. Such therapy is obviously inconvenient (as it requires bed rest), is prolonged, is somewhat dangerous, and is rather expensive.

It is impossible to overemphasize the importance of accuracy in establishing the diagnosis of amebiasis because of the possible dangers involved in the indiscriminate use of common anti-amebic agents. This is especially true if the treatment becomes prolonged. However, the clinical diagnosis of amebic infection is often quite difficult to make with certainty. This is especially true in the mild case of amebic colitis exhibiting only vague gastrointestinal symptoms such as excessive flatus, mild diarrhea, occasional lower abdominal cramps, "heart burn," sour eructations, and the like. While amebic dysentery is more easily diagnosed, the possibility of concomitant disease must not be overlooked. If Endamoeba histolytica is demonstrated in the stool of a patient with severe diarrhea containing blood and mucus, its role in the etiology of the illness must be definitely established. The basic pathologic process may be idiopathic ulcerative colitis, bacillary dysentery, tuberculosis or some similar condition with associated amebiasis.

There is little doubt that a patient harboring Endamoeba histolytica should be treated. If he is temporarily asymptomatic or has only mild complaints, there is always the possibility that subsequent attacks may be quite serious. Also, such a person is a potential danger to the public health. Not just ameba, however, but Endamoeba histolytica must be demonstrated in the fecal material. This differentiation requires some degree of training and experience. All too frequently we have examined patients said to be infected with End-

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*The authors are indebted to Frances Guthrie, Virginia Drinnon and Joe Sykes whose technical assistance greatly facilitated the accomplishment of this work.

amoeba histolytica and have found only Endamoeba coli or other nonpathogenic amebas after repeated stool studies.

After *in vitro* studies had established that aureomycin is an amebicidal agent,[4] investigation of its clinical use was begun. At present, we are reporting 37 cases of amebic infection which have been followed from 1 to 6 months after treatment. The average follow-up period is over 3 months. These patients have had from 7 to 24 stool examinations since completion of therapy. Each stool has been examined by fresh saline and iodine preparations, by iron hematoxylin stains, and by culture on Nelson's egg yolk alcoholic extract medium.[5] Polyvinyl alcohol iron hematoxylin stain technic has been used to verify the identification of the organisms in culture.[6] *Table 1* lists the parasites found and shows the number of patients harboring each. *Table 2* shows the number of patients having parasites other than Endamoeba histolytica. Of these, all the amebas disappeared from the stools after aureomycin therapy. The flagellates in this series were not affected by the oral administration of aureomycin. Further study of the local action of aureomycin on trichomonads is now in progress.[7]

The 37 cases being reported may be divided into the following categories: symptomatic amebic colitis, 29 cases; asymptomatic amebic colitis, 2 cases; amebic dysentery with hepatitis, 2 cases; complicated amebic colitis with hepatitis, 3 cases; and amebic abscess of the liver, 1 case. Eight children and 1 pregnant patient are included in this series. A low grade fever prior to treatment was noted in 25 patients. In these cases there was an average elevation of temperature to 37.8° C. (oral) during the first 2 to 3 days of hospitalization. In 35 cases, an hematocrit, total and differential white blood cell count, urinalysis, and sedimentation rate (Wintrobe) were obtained before and following treatment. Only in 3 cases of hepatitis was there a significant leukocytosis. In only 1 case was an eosinophilia (14 per cent) noted before treatment. The sedimentation rate was elevated in 6 complicated cases. All urinalyses were within normal limits. In 31 cases, hepatic function was studied before and immediately after aureomycin treatment by the following laboratory methods: bromsulfalein retention, cephalin flocculation, prothrombin time, serum bilirubin, and total and fractional plasma protein determinations. Evidence of liver dysfunction was obtained in 6 cases: in 2 cases of symptomatic amebic colitis with complications due to Endamoeba histolytica; in 3 cases of amebic hepatitis; and in 1 case of amebic hepatic abscess. The average hematocrit in both adult male and female patients before therapy was 35.4 per cent. In 8 children, it was 37.8 per cent. In 14 cases the hematocrit examination was repeated 1 month after treatment and an average increase of 5.4 per cent was observed. Barium enemas were obtained prior to treatment in 23 patients; in 6 instances evidence of colitis was noted. One month after aureomycin therapy, repeated barium enemas in these 6 patients were essentially normal. Sigmoidoscopic examination of 14 patients before treatment showed multiple shallow ulcerations with normal intervening mucosa in the rectosigmoid in 5 cases. When this examination was repeated 1 month after therapy, no lesions were noted.

NUMBER OF PATIENTS HARBORING VARIOUS PARASITES

Parasite	Number of Patients
Endamoeba histolytica	37
Endamoeba coli	31
Endolimax nana	18
Iodamoeba butschlii	2
Chilomastix	1
Trichomonas hominis	4
Giardia lamblia	10

Table 1

NUMBER OF PATIENTS HARBORING PARASITES OTHER THAN ENDAMOEBA HISTOLYTICA

No. of parasites	0	1	2	3	4	5
No. of patients	2	15	15	2	2	1

Table 2

Careful evaluation of any method of treatment of amebiasis is rendered hazardous by the difficulty of distinguishing between relapse and reinfection. Only if patients could be hospitalized for at least 6 months, having serial stool examinations and continuous clinical observation, could this problem be definitely resolved. Frequent stool examinations are essential, for a negative stool may occur in the presence of amebic infection.

Before discharging any patient following the completion of his treatment, efforts were made to examine all of the members of his immediate family. If any of these was found to be infected with Endamoeba histolytica, he was immediately treated. Of 14 family groups investigated, 7 yielded additional positive cases. This emphasizes most dramatically the highly infectious nature of amebiasis. It would hardly seem worth while to treat a single case of amebic infection unless all of the immediate

family or associates could be studied. In this disease, education of the patient in the essentials of personal hygiene and public health is almost as important as the administration of appropriate medicine.

As indicated in *Table 3*, 4 patients with amebiasis were treated with 18 to 22¾ grams of aureomycin in divided doses in the course of 5 to 6 days. All 4 remained asymptomatic and free of parasites for 6 months. *Table 4* represents 23 patients who were treated with 2 grams of aureomycin daily for 1 week. Nineteen remained asymptomatic and free of ameba for 1 to 6 months, with an average observation period of 3 months. It is of interest that 2 of the 4 patients (*Table 5*) who showed recurrence are man and wife. Fly larvae as well as Endamoeba histolytica were found in the stools of the husband. Investigation of their housing facilities revealed most unsanitary surroundings. Neither screens nor floors were present in their lodgings. It is our opinion that these 2 cases may well represent reinfection. These patients were retreated, one with 2 grams and the other with 3 grams of aureomycin daily for 1 week and they have remained free of Endamoeba histolytica up to the present, a period of 1 month. The other 2 recurrences were in children. They were retreated, using an increased amount of aureomycin, 3 grams daily for 1 week. Examination 1 month after retreatment revealed Endamoeba histolytica in the stool of 1 child. The other has remained asymptomatic and free of parasites.

In an attempt to determine the minimal effective amount of aureomycin, 16 patients were given only 1 gram daily for 1 week (*Table 6*). Of this group, 5 were found to be positive 1 month after therapy was completed. The other 11 have remained asymptomatic and parasite-free for over 3 months. Those patients who showed a recurrence of infection were retreated using 2 grams of aureomycin daily for 1 week and are included in the 23 cases previously discussed.

Our present regimen of therapy consists of 500 mg. of aureomycin administered orally 4 times a day for 1 week. Medication is given between meals and at bedtime. In this manner, sleep is not disturbed. Aureomycin blood levels in these cases have varied during the day from 0.25 to 8 micrograms per cent. Aureomycin is followed with 200 cc. of milk. Frequently the drug is administered in chocolate milk. If the nausea becomes severe, or if vomiting develops, 100 mg. of pyridoxine are given intravenously each day together with mild sedation.

PATIENTS TREATED WITH 18 TO 22.75 GRAMS IN 7 DAYS

Case No.	Negative Stools Immediately After Treatment*	Negative Stools 1 Month After Treatment*	Negative Stools 3 Months After Treatment*	Negative Stools 6 Months After Treatment
1	11	5	4	4
2	5	5	2	3
3	6	5	3	2
4	6	5	3	4

*These stools were obtained on consecutive days.

Table 3

PATIENTS TREATED WITH 14 GRAMS OF AUREOMYCIN IN 7 DAYS

Case No.	Stools Immediately After Treatment	Stools 1 Month After Treatment	Stools 3 Months After Treatment	Stools 6 Months After Treatment
5	6—	2—	3—	3—
6	1—	6—	3—	
7	3—	2—	2—	3—
12*	10—	3+ (2 months)		
13*	6—	6+		
15*	2—	16+		
17	0	3—		
20	5—	2—	3—	
21	3—	3—	3—	
22	0	2—	2—	
23	0	3—	3—	
24†				
25	6—	3—		
26	5—	3—	1—	6—
27	7—	2—	3—	2—
30	5—	2—		
31	12—	3—		
32	1—	3+		
33	1—	3—		
34	1—	3—		
35	5—	3—	3—	3—
36	0	2—		
37	3—	3—	3—	

*These patients are included in *Tables 5* and *6*.
†This patient has been hospitalized for over 3 months and his stools have been consistently negative during this period.

Table 4

FOUR PATIENTS TREATED WITH 14 GRAMS OF AUREOMYCIN REQUIRING ADDITIONAL TREATMENT

Case No.	Stools Immediately After Treatment	Stools 1 Month After Treatment
12	8—	2+
13	4—	3—
15	5—	2—
32	2—	2—

Table 5

Of the 37 patients being reported, mild nausea was noted in 5; rather marked nausea with associated vomiting occurred in an additional 5. Only 1 patient vomited more than once. In 4 of these cases, vomiting developed on the last, or next to last, day of treatment. Of the 5 patients who experienced vomiting, 3 obtained complete relief of symptoms with pyridoxine, 1 showed definite improvement, and 1 was not affected. Other reactions to aureomycin included increased appetite in 7 cases, mild diarrhea (3-4 stools) in 6 cases, a metallic taste in 6 cases, a "fluttery" sensation in the epigastrium in 3 cases, mild pruritus ani in 3 cases, and vertigo in 1 case. Central nervous system symptoms were noted in 4 patients. These consisted primarily of a feeling of tenseness or of anxiety. It is our opinion that bed rest and limitation of activity markedly decrease toxic effects.

Three cases of amebic infection treated with aureomycin are presented as illustrations of this method of therapy.

Case 1.—E. T., a 40-year-old white man, entered John Gaston Hospital on the Medical Service with the history of a severe diarrhea for 4 months. Despite a course of "diodaquin" following the demonstration of Endamoeba histolytica, the diarrhea had progressed to 20 or 30 stools a day. It was necessary for the patient to arise approximately every 30 minutes at night. There had been marked weight loss, and the patient was so weak that he could hardly walk. Sigmoidoscopic examination revealed multiple punched-out ulcers in the rectosigmoid. Motile and cystic forms of Endamoeba histolytica were demonstrated in the ulcers and in the stools. A barium enema revealed the characteristic findings of a severe colitis. Laboratory procedures indicated hepatic dysfunction.

This patient was given 2 grams of aureomycin daily for 1 week. On the third day of treatment, he passed his first formed stool in 4 months; and after the fourth day, the diarrhea disappeared. In the ensuing 6 months over 20 negative stools were obtained. This patient has remained entirely asymptomatic for over 6 months. His weight has increased from 117 to 152 pounds.

It is of interest that examination of this patient's family revealed that his wife and 3 of his 4 children had symptomatic amebiasis.

Case 2.—B. M., a 21-year-old white man, entered John Gaston Hospital on the Surgical Service with the history of sharp, continuous, right lower abdominal pain of 24 hours duration. Examination revealed generalized abdominal tenderness which was more marked in the right lower quadrant. The white blood cell count was 8,800 per cu. mm. with 54 per cent polymorphonuclear leukocytes, 41 per cent lymphocytes, and 5 per cent large mononuclear leukocytes. The patient was subjected to an appendectomy and an amebic appendicitis was diagnosed at microscopic examination (*Figs. 1* and *2*). Subsequent investigation of the patient's history disclosed the existence for 6 months of "heart burn," belching, abdominal distension after meals, and increased flatus. Stools were positive for Endamoeba histolytica in both cystic and trophozoite forms. Following aureomycin therapy, this patient has been asymptomatic and free of ameba for over 3 months. Epidemiologic studies revealed that the patient's wife was also infected with Endamoeba histolytica.

Case 3.—E. H., a 35-year-old colored man, entered John Gaston Hospital on the Surgical Service with the history that for 1 year he had suffered from intermittent episodes characterized by numerous watery, brown, foul smelling stools containing flecks of blood and mucus. These stools usually numbered about 6 per day; the attacks ordinarily lasted 1 to 2 days and recurred at intervals of 2 days to 1 month. They were accompanied by colicky pain in the

PATIENTS TREATED WITH 7 GRAMS OF AUREOMYCIN 7 DAYS

Case No.	Stools Immediately After Treatment	Stools 1 Month After Treatment	Stools 3 Months After Treatment	Stools 6 Months After Treatment
8	4—	3—	3—	4—
9	6—	3—	3—	
10	10—	3—	1—	2—
11	3—	3—	3—	3—
12	3—	2+		
13	2—	1+		
14	0	2—	3—	2—
15	2—	2+		
16	3—	3— (2 months)		
17	2—	3+		
18	3—	3—	3—	
19	3—	3—	3—	3—
27	0	2+		
28	0	4—	2—	
29	0	5—	2—	
30	0	3+		

Table 6

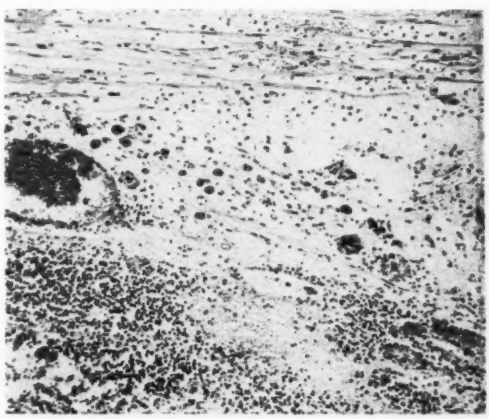

Fig. 1
This picture shows a low power magnification of the appendix in *Case 2*. Note amebas in the wall of the appendix.

lower abdomen. The onset of the present illness had been of this nature but had continued unabated for about 3 months. It had also been associated with belching, sour eructations, and the presence of a mass in the left upper abdominal quadrant. Anorexia and an undetermined weight loss had been noted. The clinical impression was carcinoma of the transverse colon. A barium enema was similarly interpreted. Laboratory procedures revealed evidence of hepatic dysfunction.

At operation, a firm mass, 10 cm. in diameter, was found in the left transverse colon near the splenic flexure. Surgery consisted of splenectomy and resection of the colon with subsequent end-to-end anastomosis.

Microscopic examination of the tumor revealed an amebic granuloma. The patient's stools were then examined and were found to be positive for motile and cystic forms of Endamoeba histolytica. Aureomycin therapy in dosage of 2 grams a day for 1 week was instituted and for over 3 months the patient has been asymptomatic and free of ameba. During this period, his hematocrit reading has increased from 35 to 46 per cent, and there has been a substantial gain in weight.

DISCUSSION

By *in vitro* studies, we have shown that aureomycin is an active amebicidal agent. The results of its use in 37 cases of amebic infection indicates that it is rapidly effective in the relief of symptoms, and is also a curative drug, in amebic colitis, amebic hepatitis, and amebic dysentery. It is also effective against carriers as it destroys both cystic and trophozoite forms of Endamoeba histolytica. We are unable, as yet, adequately to evaluate its role in amebic abscess of the liver.

In 8 cases treated with aureomycin, anatomical changes were demonstrated by sigmoidoscopic examination, by roentgen procedures, and by surgery with subsequent microscopic examination of resected and biopsied tissue. In 6 cases, a barium enema revealed a contraction deformity with patency of the ileocecal valve. Examination 1 month after aureomycin therapy was negative. It is of interest that these 8 cases responded to aureomycin treatment as readily as those cases in which definite tissue invasion by ameba could not be detected. We feel that this is of marked importance in as much as many physicians are of the opinion that it is easier to eradicate Endamoeba histolytica from the gastro-intestinal tract in those cases in which no significant tissue invasion has occurred.

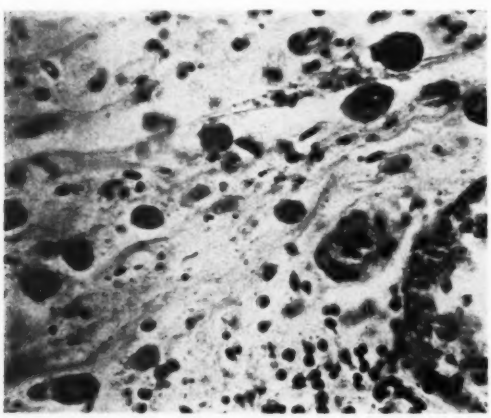

Fig. 2
High power picture of appendix in *Case 2*. Note amebas.

No serious toxic reactions to this antibiotic were noted in this series. This was true in children and in pregnant patients. Indeed, the former appeared to tolerate this antibiotic better than adults. In no case was it necessary to interrupt treatment because of toxicity.

Four cases of amebic infection were treated with 18 to 22¾ grams of aureomycin during the course of 1 week. All have remained asymptomatic and free of amebas for over 6 months. Twenty-three patients were treated with 2 grams of aureomycin daily for 1 week. In these cases, 500 mg. were given orally between meals and at bedtime. Aureomycin blood levels in these patients varied from 0.25 to 8 micrograms per cent during a 24-hour period. Although 4 of these patients showed Endamoeba histolytica in the stools 1 month after treatment, all remained asymptomatic. Unless patients are under constant control it is difficult to distinguish between relapse and reinfection. It is felt that 2 of these 4 patients, a man and his wife, may represent reinfection. These 4 cases were retreated with aureomycin and all but 1 have remained negative up to the present, a period of 1 month. Three grams of aureomycin daily for a week may be required in resistant cases. Recently other investigators have obtained results confirming this work.[8]

While aureomycin is actively amebicidal *in vitro*, its exact mode of action when administered orally has not yet been established. In our opinion the 4 most likely possibilities are: (1) a direct action by this antibiotic on the ameba in the intestinal tract; (2) an indirect action on the ameba through an alteration of the environmental bacterial flora; (3) an action mediated by the vascular system; or (4) by a combination of 2 or more of the above. In an attempt to elucidate the problem, detailed studies of the intestinal bacteriology of patients receiving this drug are in progress, and efforts are being made to determine the concentration of aureomycin in the various portions of the intestinal tract, especially in the cecum. While the administration of aureomycin immediately after meals appears

to reduce gastro-intestinal discomfort, it likewise decreases the blood level; and since the importance of the aureomycin level in the circulatory system in amebiasis is uncertain, we prefer to give treatment between meals.

Careful *in vitro* and clinical studies have failed to reveal evidence of the development of resistance by ameba to aureomycin. While additional investigation is essential, it appears that aureomycin affords a safer, shorter, and perhaps more effective method of treatment of amebiasis. It is also felt that since this is the first instance in which an antibiotic has been found to be effective against protozoa, a new field has been opened to medical research.

SUMMARY

Thirty-seven cases of amebic infection treated with aureomycin are reported in this paper. Aureomycin has been found to be effective in 36 of these cases. A suitable regimen appears to be 2 grams a day for 1 week. In the series of 37 cases treated, 35 had symptoms of amebiasis and 8 had demonstrable anatomical evidence of tissue invasion. Aureomycin is as effective against the cystic as the trophozoite forms. No significant toxic reactions to this antibiotic were noted.

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DISCUSSION (*Abstract*)

Dr. Donald S. Martin, Durham, N. C.—In this paper the results are clear cut, the amebiasis is apparently cured and the drug is nontoxic.

It is a remarkable advance to have a drug like aureomycin now, as a substitute for emetine which, in the past, has been the only proven amebicidal agent. The curing af amebic dysentery with a week of treatment is almost unbelievable.

When compared with Hargrave's regime, which requires administration of bismuth iodide for 5 days, along with retention enemas and a follow-up of at least 20 days with "diodoquin," the aureomycin treatment is not only simple but much safer.

I am particularly interested in this problem from the standpoint of the nature of the action of the aureomycin. Does it destroy the bacteria, or is it directly amebicidal? The evidence presented today, combined with experimental data obtained on the activity of penicillin and streptomycin, suggests strongly that the drug is directly amebicidal.

The group at Vanderbilt, in studying the cultivation of amebae in a bacteria-free medium, used penicillin and streptomycin and were able to inhibit the growth of the bacteria, with very little if any effect upon the amebae.

Dr. Sprunt (closing).—I should like to emphasize what has already been said by Dr. McVay. I have been skeptical of the frequent diagnosis of amebiasis as made on the basis of the finding of amebae in the stools. In the Memphis area we are told that on the basis of this criterion at least 10 per cent of the population have amebiasis. Yet in a large autopsy service over the last 5 years we have found less than 0.25 per cent of the patients with lesions which could be attributed to amebiasis. Various reasons have been given for this discrepancy which will not be discussed at this time. I should like to stress that in this series we had 2 instances, as shown in the illustration, where the amebae were demonstrated to have invaded the tissues of the body and 5 more cases with definite x-ray evidence of damage to the tissue. It is important to point out that these cases yielded to aureomycin therapy as well as the other cases which had not such strong evidence of tissue involvement.

AMEBIASIS IN CIVILIAN HOSPITAL AND VETERAN PATIENTS IN NORTH CAROLINA*

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Amebiasis.—There is still considerable doubt in the minds of the majority of practitioners of medicine concerning both the clinical and the public health importance of infection by the Endamoeba histolytica. This is due to several causes. The synonymy of the older literature includes all forms of the intestinal manifestations of this infection within the generic term "amebic dysentery." There is widespread acceptance of the concept that in the so-called asymptomatic carrier or cyst passer the absence of acute symptoms indicates that the organism has no deleterious effect upon the host indi-

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vidual. These doubts further depend upon the equally widely held concept that the infection is predominantly limited to the tropics and the subtropics, while in fact the limiting factors are not those of climate or geography but sanitation and personal hygiene. The potential public health significance likewise is beclouded by lack of definitive and conclusive epidemiologic studies and by lack of uniformity throughout the country with respect to the status of amebic infection as a reportable disease.

It is generally recognized that infections are most numerous in the unsanitated areas of the tropics and the subtropics. It is likewise accepted that the incidence is higher in certain portions of the Southern states than in other areas of the United States. It is to be expected that surveys conducted in different regions have yielded widely divergent results. The extremes reported range from 0.2 per cent among 522 individuals in Baltimore, Maryland, to highs of 38 per cent positives among 374 individuals in a rural community in Tennessee,[1] and 55 per cent among 119 inmates of an orphan asylum in New Orleans.[2] The results of numerous surveys indicate that the incidence of infection in the United States as a whole is at least 10 per cent and probably higher. Thus Faust[3] has called attention to the fact that most of the data upon which the incidence rates have been estimated is based upon a single fecal examination and that if more effective technics had been used the actual percentage might be as high as 20. Craig[1 4] has emphatically summarized the situation:

"The importance of these data from a public health standpoint cannot be over-estimated for we know that Endamoeba histolytica is a pathogenic parasite and, up to the present time, there is no scientific proof that it can live indefinitely in the lumen of the bowel without penetrating the tissues and producing pathological lesions. This renders amebiasis a public health problem of great importance and worthy of the most serious consideration by health officials, even in temperate regions where it was formerly believed the infection did not exist."

Clinicians have been confused by the relative infrequency with which acute dysentery is associated with this infection. They have been further misled by the term, "asymptomatic cyst-passer," which has crept into the literature in the past quarter century. They do not appreciate that dysentery is a complication rather than a usual clinical phenomenon. This misconception and lack of information have led to sharply separated points of view. Unfortunately the majority appear to believe that in the absence of chronic diarrhea or true dysentery the finding of Endamoeba histolytica in the feces is incidental and of little or no clinical significance. The opposed school, numerically much smaller in number and representing for the most part physicians trained and interested in tropical medicine, hold to a very different viewpoint.

This viewpoint is supported by good evidence. Dobell and O'Connor[5] in 1921 said that the Endamoeba histolytica is invariably inimical to the host and that its presence is always associated with tissue damage even though clinical evidence is lacking. The pathology of asymptomatic intestinal amebiasis and of acute amebic dysentery differ only in degree and extent. Ulceration of the mucosa of the colon is the characteristic process. The lesions are restricted to the colon except in rare instances when the ileocecal valve and adjacent ileum may be involved by extension of an acute process in the cecum. The lesions may occur throughout the colon, or they may be limited to certain areas. The commonest sites in the order of frequency are the cecum, ascending colon, rectum, sigmoid and appendix. When the ulceration is localized, the cecum and ascending colon are much more frequently involved than the rectum or the sigmoid.[6] This fact is fundamentally important since cases with localized ulceration do not have dysentery and may not have diarrhea.

Superficial destruction of the mucosa without appreciable invasion of the deeper tissues constitutes the initial lesion.[7] This may be limited to small areas or it may occur over a considerable extent of the mucous membrane. On gross inspection these changes may be barely discernible. Congestion and thrombosis of minute vascular radicles occur beneath these areas. The process is usually progressive and ultimately the amebae penetrate into the submucosa and lead to ulceration.

These early observations have to some extent been pushed into the background by speculation concerning the possible existence of strains of Endamoeba histolytica of varying virulence and invasive capacities. Although variations in virulence for experimental animals have been demonstrated with different strains of the organism, Meleney and Frye,[8] in discussing their experimental work, said:

"Although our observations seem to indicate that some strains of Endamoeba histolytica possess a low degree of virulence for kittens, and probably for human beings as well, this conclusion does not lessen the importance of instituting treatment in every case of amebiasis encountered in medical practice even though there is no history of symptoms which might be interpreted as amoebic in origin. The least virulent strains which we have encountered have produced lesions in a few kittens and it is reasonable to suppose that they would do so in man also."

Previously, Kessel,[9] in studying strains from cases of amebic dysentery and from asymptomatic carriers, concluded:

"The resistance of the host is a more important factor in the production of clinical amebiasis than differences in the virulence of the parasite."

Recognition that small races of the organism are commonly found in carriers and large races in cases of acute dysentery has also led some to believe that the strains producing small cysts are nonpathogenic. While there is evidence to indicate that the small-cyst strains are less pathogenic than the large-cyst strains, there is no evidence to prove that they are nonpathogenic.[4] As Craig[1 4] has stated, there is no justification for refusal to accept the dictum laid down by Magath and Brown[10] in 1930:

"At this time it is quite unnecessary to defend the pathogenic role of Endamoeba histolytica. The pathologic lesions that it produces have been so well described and so frequently encountered as not to leave a shadow of a doubt but that the organism can produce serious injury to tissue. Koch's postulates have been so repeatedly confirmed that an adequate defense cannot be offered for this parasite's harmlessness."

Transmission of the infection in the great majority of instances, if not invariably, is by ingestion of the relatively resistant encysted stage. In this form, the organism may survive for considerable periods of time outside the human body, ultimately to reach a new host in contaminated food and drink. The hazards of polluted water supply were dramatically demonstrated by the Chicago epidemic of 1933. The use of human excreta and water containing crude sewage on vegetable gardens has long been recognized as an important method of spread of the infection. In this connection, the use of sewage sludge from disposal plants must be regarded with suspicion. Contamination of food and drink by food handlers who are passing the cysts of Endamoeba histolytica is almost certainly the most important source of infection in communities having protected water supplies and adequate sewage disposal facilities. In areas where the house fly has access to crude human feces on the one hand and to human food on the other, it must be held suspect since it has repeatedly been demonstrated that viable cysts may be recovered from the intestinal tract as long as forty-eight hours after ingestion.

The material on which this report is based has been collected from January 1, 1947, through October 31, 1949. It is derived from two sources: miscellaneous patients admitted to the various services of the North Carolina Baptist Hospital, and veterans seen in the Tropical Disease Clinic of the Regional Office of the Veterans Administration, Winston-Salem, North Carolina.

Neither group constitutes a survey in the statistical sense of the word and, as will be brought out subsequently, the findings in the two groups are not directly comparable. The patients in the hospital were not under the immediate control of the writers. While there was reasonable uniformity in the collection of specimens for examination, there was variation both in the methods of obtaining the individual specimens and the total number of specimens per patient sent to the laboratory for examination. The individuals, however, are entirely unselected except in so far as they were in a general hospital for treatment of a great variety of conditions.

The veterans on the other hand comprise a highly selected group. In the early stages of the work of the Tropical Disease Clinic, facilities and staff did not permit examination of all individuals sent to the Clinic. Consequently only those veterans whose symptoms led to reasonable suspicion of infection by the Endamoeba histolytica were subjected to stool examination. Although the basis for examination has been considerably broadened in the last year, the veterans still constitute a highly selected group, since they comprise individuals complaining of poor health and since those examined have been very largely restricted to individuals with a service-connected disability. The number of specimens provided by members of the veteran group has been more uniform and more satisfactory. In the initial stages of the work the veteran patients were required to deliver a casual stool on each of three successive days. Subsequently this practice was discontinued because of the excessive demands on the time of the individual and because of the expense involved to the Veterans Administration. For the past year, the individual to be examined has been given one ounce of magnesium sulphate before breakfast on the morning of examination. Specimens have been collected in the laboratory and the veteran has been held in the laboratory until a minimum of three specimens has been obtained. Examination has been carried out immediately. No effort was made in either group to ascertain the incidence of the total protozoal population of the intestinal tract. Attention was restricted entirely to the presence or absence of pathogenic organisms. Consequently, when Endamoeba histolytica was found and the direct examinations and concentrates

revealed no ova of parasitic helminths, further examination was not made.

Diagnostic Methods.—The methods of examination have been uniform for both groups. The diagnostic criteria for the identification of Endamoeba histolytica as stated by Craig[1 4 11] have been rigidly adhered to. The routine for the casual stools and for those obtained after the administration of magnesium sulphate varied slightly. In the casual group each specimen was examined by direct microscopy of saline and iodine emulsions and by microscopic examination of similar preparations after zinc sulphate centrifugal concentration. In the magnesium sulphate group the first stool passed after the administration of the cathartic was usually discarded. The second specimen was examined by the methods used for the casual specimens. The third, fourth and subsequent stools were searched for trophozoites by direct microscopy of saline and iodine preparations. In all specimens particular attention was directed to the search for flecks of mucus which, when found, were immediately examined. Part way through the period of study, Quensel stain was added to the procedures for the identification of trophozoites, and for the past year permanent iron hematoxylin stained preparations have been made from positive stools for additional verification and for filing.

Findings.—One of the problems in which we have been interested has been to determine, if possible, the most suitable methods of obtaining stool specimens to demonstrate the maximum possible number of positive infections. It is generally recognized that one casual specimen will not reveal more than thirty per cent of infections. As already stated, the collection of daily specimens over a period of three or four days proved too time consuming and expensive, especially in the case of the veteran patients. *Table 1* presents the cumulative totals of positive findings in the second, third and fourth specimens obtained from eighty cases in whom Endamoeba histolytica were demonstrated by the magnesium sulphate purgation technic.

It will be seen that examination of the second, third and fourth stools demonstrated the presence of this infection in all of the eighty cases. Seventy-eight per cent of the infections were demonstrated by examination of the second stool alone; examination of the second and third specimens revealed 90 per cent of the positives. In three individuals, the Endamoeba histolytica could be demonstrated only in the fourth specimen.

It seems probable that the relative infrequency and the difficulty of diagnosis of amebiasis in individuals not suffering from actual dysentery is in part due to improper collection of fecal specimens and in part to the acknowledged difficulties of identification and the lack of fully trained technicians.

The findings in the hospital and the veteran groups are presented in *Table 2*.

These figures indicate that infection by Endamoeba histolytica is a relatively common finding among both veteran and nonveteran patients in the state of North Carolina. In view of the fact that the hospital patients provided only an average of 2.1 specimens for examination, it is probable that the actual infection rate would be between 15 and 20 per cent in the group examined.

Infection rates of the magnitudes found in these two groups immediately raise two important questions. What is the public health significance? What is the clinical significance? The first question is not relevant to this discussion. It should be emphasized, however, that amebiasis is a communicable disease and that the chronic cyst-passer is a potential menace to his contacts varying in importance with his environment and his occupation.

Clinicians are, generally speaking, more concerned with reaction of the individual host to a specific infection. As has been stated previously, there is a widespread belief that the cyst-passer

INCIDENCE OF ENDAMOEBA HISTOLYTICA IN MAGNESIUM SULFATE PURGATION STOOLS, 80 POSITIVE CASES

	Per Cent
First stool (not examined)	(30)*
Second stool 61 cases	78.2 positive
Third stool 68 cases	90.5 positive
Fourth stool 71 cases†	100.0 positive

*Thirty per cent accepted as positive on one casual stool examination.

†Seven cases positive on second or third stools, not examined further.

Table 1

INCIDENCE OF ENDAMOEBA HISTOLYTICA IN HOSPITAL AND VETERAN PATIENTS

North Carolina Baptist Hospital Patients		
Number examined	2,522	
Average number stools per patient	2.1	
Patients positive for Endamoeba histolytica	321	12.7 per cent
Veteran Patients, Tropical Disease Clinic		
Number examined	878	
Average number stools per patient	5.2	
Patients positive for Endamoeba histolytica	277	31.6 per cent

Table 2

without a history of dysentery or acute diarrhea commonly suffers no clinical effects from his infection. Our experience, however, leaves us in complete agreement with Craig's[4] statement:

"That Endamoeba histolytica is responsible, not only for amebic dysentery, but also for a host of other symptoms referred to the intestinal tract, is proven by the disappearance of such symptoms after appropriate treatment has resulted in the disappearance of the causative amebae."

Actual dysentery has been extremely rare in both groups of patients. A significantly large number of individuals have complained of alternating periods of mild diarrhea and constipation without gross blood or mucus in the stools. Mild low abdominal cramps are not unusual, especially in individuals having loose or diarrheal stools. Chronic constipation alone, frequently with persistent pain of varying degrees of severity in the right lower quadrant, has been a not unusual symptom. The most frequent complaints in both groups of patients have been persistent asthenia and undue fatigability with inability to gain weight. This syndrome is usually accompanied by indefinite abdominal discomfort which the individual is unable to localize or clearly to describe. Frequently there is intolerance of fats and grease in the diet. In the great majority of our cases, amebiasis has not been suspected because of the absence of dysentery and other classical acute phenomena. The confused and indefinite clinical picture together with the usual negative findings on x-ray examination of the gallbladder and the gastro-intestinal tract frequently is the basis for the diagnosis of psychoneurosis. So common is this, in fact, that we have come to regard this diagnosis when combined with chronic abdominal symptoms atypical of the common pathologic entities as almost pathognomonic of infection by the Endamoeba histolytica. Effective treatment in certain of these individuals gives dramatic results. A significant proportion, however, continues to have chronic symptoms of lesser severity, the cause of which is difficult to determine.

SUMMARY

(1) Infection by Endamoeba histolytica has been demonstrated in 12.7 per cent of 2,522 patients admitted to the different services of the North Carolina Baptist Hospital.

(2) This infection has been found in 31.6 per cent of 878 veterans examined in the Tropical Disease Clinic of the Regional Office of the Veterans Administration, Winston-Salem, North Carolina.

(3) The infection is frequently characterized by varying degrees of chronic disability, ill-defined symptoms, and negative x-ray examinations of the gastro-intestinal tract. This syndrome frequently leads to the diagnosis of psychoneurosis.

(4) With competent laboratory personnel, the administration of magnesium sulphate the morning of examination and the immediate examination of the first four stools will reveal the great majority of infected cases and will frequently permit completion of the diagnostic procedures in one day.

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DISCUSSION (*Abstract*)

Dr. Walter Simrall Wyatt, Lexington, Ky.—There is probably no one who did more to emphasize the clinical importance of amebiasis than Drs. Craig and Faust.

Studies of the incidence of this disease, made throughout various localities of this country, have shown that it is not confined to the Southern states. The Chicago epidemic, in spite of the distress and sorrow following in its wake, had one beneficial effect. These patients scattered to their homes throughout the United States and Canada and physicians, as well as surgeons, became aware of the seriousness of the epidemic. Many learned much more of a disease which they knew only casually.

Symptoms of amebiasis, excluding dysentery and extra-intestinal lesions, are often mild and bizarre. There may be only discomfort, distress or mild pain which recurs throughout the day, is not localized but shifts about the quadrants of the abdomen. Rarely do the patients complain of pain during the night. Some patients have difficulty in describing their distress and give the impression of neurasthenia. Many have been treated for appendicitis, peptic ulcer, cholecystitis, chronic ulcerated colitis, pelvic disease and even hemorrhoids.

The treatment of the disease has also advanced. The introduction of emetine in 1912 was a considerable advance

over the treatment with ipecac and colonic irrigations with quinine. The halogenated hydroxyquinolines were brought on; chiniofon in 1921; "vioform" in 1931 and "diodoquin" in 1936. Acetarsone ("stovarsol"), the first of the arsenicals to be used extensively, appeared in 1923. Later a much less toxic arsenical, carbarsone, an excellent amebicide, came on the market. In 1949, chloroquine, a derivative of 4-amino-quinoline series, has the properties of three to four-fold lesser degree of localization within the intestinal walls, almost complete absorption from the gastro-intestinal tract and its extensive localization in the liver, some five hundred times its plasma concentration. It seems to be an effective chemotherapeutic agent for amebic infections of the liver, being at least as effective as emetine but without the toxicity of emetine. Also in this year there have been introduced two thioarsenites (dithiocarboxymethyl and diothiocarboxy-phenyl). These agents are ten times more effective than carbarsone and give greater distribution of the active agent to the intestines and liver. They are derived by detoxication of carbarsone oxide by substituting sulfhydril groups. Another arsenical, bismuth glycolylarsenilate ("milibis"), has been offered as an amebicide but its clinical use in this country has been meager. It is trite to say that all arsenicals must be used with caution on account of instances of arsenic sensitivity. More recently McVay and his associates of the University of Tennessee have treated several cases of amebiasis with aureomycin. The gastro-intestinal symptoms disappeared, the stools became normal and were negative for cysts and trophozoites and the aureomycin blood level reached 8 micrograms per 100 cc. The high blood level obtained in these cases led the investigators to believe that aureomycin therapy will be successful in extra-intestinal lesions such as hepatic abscess. It will probably be a year or two before complete evaluation of these newer drugs will be attained.

Dr. Gordon McHardy, New Orleans, La.—Dr. Mackie is discussing a special group of individuals, and the incidence of amebiasis in general is certainly not so high as 33 per cent. In New Orleans, in the specialized practice of gastro-enterology, we encounter amebiasis in from 12-15 per cent.

In a survey done in 1943 the incidence was 14 per cent. In 1949 it was 12 per cent. About 10 per cent may be correct for a locality in which amebiasis is considered prevalent. New Orleans is a seaport, it has semi-tropical climate, and there has not been too great an effort by our public health officers to do anything to control the infection in food handlers and in those entering our country from the tropics. That the war years precipitated an increase in the incidence of amebiasis is not unlikely. It is certainly true that there is a greater knowledge of amebiasis now and that we do see reports of incidence of amebiasis from sections of the country from which previously there were none.

The symptoms associated with amebiasis certainly may be bizarre and I agree that the so-called carrier state should not be accepted as an innocent entity. Dr. Mackie and others have demonstrated that in patients without symptoms the Endamoeba histolytica has invaded the wall of the bowel and in many instances has presented itself elsewhere in the body so that the disease has become advanced. On the other hand in some patients in whom we find Endamoeba histolytica parasites, no symptoms are detected nor on extensive examination is there any evidence of the disease process, or that these patients are below par in any respect.

We should not, therefore, go overboard in blaming symptoms upon amebiasis. Individuals may be parasitized with Endamoeba histolytica without being actually actively sick individuals. Also the presence of Endamoeba histolytica in the stool may occur concomitantly with other disease and we should not overlook these in individuals with severe organic disease.

Diagnosis requires cognizance of the incidence of amebiasis, parasitologic knowledge and a sincere effort in the search for Endamoeba histolytica. This has been amply stressed by others and reemphasized by Dr. Mackie.

In relation to therapy it is my hope that emetine is about to be discarded and to be replaced by "aralen phosphate." There are mild side reactions to "aralen" and some individuals cannot use it. Of the other routine drugs, carbarsone is still in common usage but arsenic sensitivity must always be remembered. "Anayodin" is effective when properly used in adequate dosage and when the preparation prescribed does not carry too heavy a resistant enteric coat. We have been well satisfied with "diodoquin." At the present time one of the newer arsenicals, "milibis," seems to be most promising, but it too is an arsenical. In our experience we have had a case of arsenical encephalitis and two patients with an arsenical dermatitis subsequent to the use of this drug. Another promising preparation is "aralen naphthoate," which is less readily absorbed than "aralen phosphate," and in our experience to this time has not failed in a single instance of uncomplicated amebiasis.

Dr. James L. Borland, Jacksonville, Fla.—In Florida, in a survey of about 1,200 patients chosen to represent the rural and urban distribution of this disease, the maximum incidence was around 7 per cent. In airline personnel returning from the tropics, it was slightly higher, 13 or 14 per cent. A second survey of approximately 700 resulted again in a figure of 6 or 7 per cent. From the results of the various surveys it seems fair in most of the Southern states to assume an over-all incidence in the population in excess of 5 per cent, with considerable local variations. Approximately one-third of these patients have no symptoms that can be reasonably ascribed to the ameba. At least one-half show only mild symptoms. This at once raises the question as to whether all of the organisms which have the morphologic characteristics of Endamoeba histolytica are actually the same organism.

We recognize the organisms by the color, type of granules, and the geometric arrangement of their nucleus, mobility, and so on, but there is no evidence that I know in the literature that this morphologic structure is not common to a variety of organisms. There is no evidence that all strains of organisms answering this morphologic classification carry the ability to damage the host. Anybody who has examined large numbers can detect differences in the appearance of the organisms, and I believe, as a rule, the trophozoite which is isolated from the dysenteric patient does not closely resemble the organism which is isolated from patients who have no symptoms. The latter is slower, more sluggish, browner, and has larger granules; the nucleus is not quite symmetrical. I question whether the amebas are true pathogens.

In any case, the proper evaluation of the symptoms is difficult. It is questionable at this time whether a patient should be subjected to prolonged courses of admittedly toxic drugs for minor ills. I certainly question the use of emetine

and I generally suspect the use of some of the newer drugs in the treatment of patients who otherwise are apparently perfectly well except that they harbor this parasite. The only possible use for emetine in those patient is to prevent liver abscess, the incidence of which is quite low. A study of the figures concerning the duration of the life of amebas in the liver or deeper tissues does not show definitely how long a colony may exist in the liver. Therefore, if a patient has been known to harbor these parasites, if they are removed from the lumen and the superficial tissues, and, if the patient is warned of the circumstances, I see no real danger in allowing him to go without emetine.

Dr. Ryle A. Radke, Lieutenant-Colonel, U. S. Army, Fort Knox, Ky.—I think in defense of the War Department, one might say that 3,000 stools were examined at 4th Service Command Laboratory at Fort Oglethorpe, Georgia. Roughly divided into groups of 1,000 those from the ETO which included Africa and the Middle East had an incidence of Endamoeba histolytica in the stool of 18 per cent. Those from the Pacific had an incidence of recovery of Endamoeba histolytica of 13 per cent, while those who did none of their war service outside of the United States had 10.7 per cent. So I think that there was definitely a difference in at least this group of soldiers in those that had been overseas.

During the past three years I have been concerned with finding an amebicide which is effective and considerably safer than emetine. I feel that Klatskin and Friedman's data in which complications following emetine therapy are reported in 91 per cent suggest the need for such a drug, especially in view of the widely accepted fact of the therapeutic inefficiency of emetine. I was stimulated by the apparent response to treatment with atabrine of an amebic liver abscess in 1946 to investigate the amebicidal effect of atabrine. Klein and I have investigated the *in vitro* effect of atabrine on Endamoeba histolytica. We find it definitely interferes with the growth and development of the ameba and there is a definite increase in encystment of the organism when atabrine is added to the culture. We used the Cleveland Sanders medium, as well as Boeck and Droehblov's medium. We were unable to be certain whether the atabrine caused its effect by changing the bacterial flora or not. We then searched for a group of persons with amebiasis who had visible rectal lesions. We have observed in ten of these, the lesions of amebiasis for a period varying from 10 to 60 days, to make certain that the lesions from which we recovered the organisms, did not heal spontaneously. In the observed cases, most of them got worse, none disappeared. Following this, a group of twelve cases of amebiasis with rectal lesions were treated with atabrine alone. We found in each instance that the ulcerations healed. We believe our data, both *in vitro* and clinical, suggest the need for combining with atabrine a drug capable of eradicating the ameba cysts. Consequently, we have employed atabrine 0.1 gram four times daily for 15 days and carbarsone 0.25 gram twice or thrice daily for 10 days concurrently. With this regime the relapse rate has been about 12 per cent in cases followed from 60 to 365 days.

As to the incidence of complications, one of our cases developed a toxic delirium on a dosage of 0.1 gram of atabrine four times a day for 11 days. A man previously treated with arsenicals for syphilis developed exfoliative dermatitis which responded promptly to treatment with BAL. Subsequently, treatment with atabrine and "diodoquin" was carried out without trouble. We believe that a complication as grave as exfoliative dermatitis should be accepted as indicating the necessity for close observation while using carbarsone.

Dr. Mackie (closing).—The differing viewpoints concerning intestinal amebiasis as they have been presented at this meeting are indicative of the changing perspective of the clinical significance, the gaps in current knowledge concerning pathogenicity, and the controversial matters pertaining to diagnosis.

The root of one of the major problems lies in the lack of agreement concerning laboratory methods and the morphologic criteria to be met for specific identification of the Endamoeba histolytica. These criteria have long been established by such distinguished protozoologists as C. M. Wenyon and Clifford Dobell. Probably some of the continuing controversies among physicians would cease were the work of these authorities better known.

Clinicians who base their concept of the pathogenicity of Endamoeba histolytica on the associated clinical phenomena are unquestionably confused by the nomenclature and descriptions in the older literature which still appear as unfortunate heritages from the past in many of our modern texts. The conflict between acute dysentery or diarrhea as the result of this infection, and the rarity with which these conditions are encountered in practice has naturally led to marked division of opinion. On the one hand is the too widely held belief that, in the absence of dysentery, the finding of Endamoeba histolytica has little or no significance. On the other hand, there is the concept of strain variation in virulence and that the small races are non-pathogenic.

This latter problem has been well and competently studied. Meleney and Frye concluded from the results of experimental work with kittens that it is not justifiable to assume that the small races are non-pathogenic for man. Kessel reached very similar conclusions, that the condition of the host is probably of greater importance that morphologic differences between strains. Furthermore, mutation is a well known phenomenon in the field of bacteriology. It is not unreasonable to assume that it may occur with certain protozoa and, in fact, alteration from a small to large race of Endamoeba histolytica has been observed in culture.

The question of the desirability of treatment of cases lacking the so-called classical symptoms, especially in the presence of infection by a small race, is again a very controversial topic. It must be remembered that this organism is a true parasite and an invader of the host's tissues.

The technic of treatment and the choice of drugs should be based upon knowledge of the histologic pathology and particularly upon the pharmacologic limitations of the available amebicidal drugs, particularly their amebicidal concentrations in the tissues on the one hand and in the intestinal contents on the other. The essence of the therapeutic problem lies in obtaining such concentrations simultaneously in both areas. No single drug can be depended upon to accomplish this.

An important step toward the ultimate solution of these problems and, we hope, resolution of some of the controversies has been accomplished recently by the creation of a Committee on Amebiasis by the American Society of Tropical Medicine.

DIARRHEAL DISEASES IN THE SOUTH*

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Jackson, Mississippi

Diarrhea has been defined as "too frequent evacuation of too fluid stools." It might also be defined as more than the usual number of stools which are altered in degree of consistency toward the fluid state. It is realized that both of the components of the title of this paper, the physical symptom of diarrhea and the geographical area of the South, are much too large to permit extensive specificity about either.

This discussion is an attempt of an individual to analyze facts, suppositions, unfounded beliefs, and the possibility of applying even the facts at hand. If the problem of diarrhea may be reviewed in relation to its extent and causes and in the light of its probable controlability, possibly this discussion may be of value. Diarrhea being the commonest symptom of transmissible diseases affecting the gastro-intestinal tract makes of this symptom one of tremendous importance in public health. Even though it may involve only one or a small group of individuals in a community or family at a given time, it is most frequently a sign of a smouldering infectious process within that community, or a deficiency in personal and environmental hygiene.

One can find in the literature almost any type of classification of diarrheas desired. They may be classified as to cause, pathology, symptomatology, anatomical regions involved, severity, and duration. Even this paper is intimating a geographical classification. Among other things all of this is an indication of the seriousness and unweildiness of the general problem. It is one of the public health problems which obviously must have more concerted effort of public health workers, private physicians, and the public in order that real progress may be made.

As to the causes of diarrhea, again one may find many listings of causes. Leake[1] classifies the causes of acute diarrhea as follows: amebiasis, bacillary dysentery, food poisoning, Salmonella, local irritations by heavy metals, allergic reactions, and psychoneurotic reactions. Bockus[2] lists thirteen causes of chronic diarrhea in order of frequency of occurrence and in this list he places amebiasis in tenth and bacillary dysentery in eleventh position. In studying other lists of causes of diarrhea one would probably add such items as ulcerative colitis, carcinoma, parasitic diseases, nutritional disturbances, and other constitutional disorders.

It is obvious in studying the literature that the frequency of occurrence of diarrhea is unknown as well as the frequency of this symptom's resulting from each of the known causes. It is known that a relatively large share of the total diarrhea is due to transmissible organisms and toxic materials, and it is believed that most of this portion of the diarrheas should be controllable. The size of the problem as indicated by morbidity is unknown. First, relatively few persons with diarrhea go to a physician; secondly, of those who go not many are properly classified as to cause; and thirdly, of those who go to a physician and are properly diagnosed few cases find their way into tabulating machinery. One must not be misled by statistics on frequency of occurrence of diarrhea. It is amazing to see the difference in reported dysentery statistics in adjoining states, the only real differences between the two states being names of the states and methods of reporting. Just as amusing is it to see two general practitioners in the same community, one of whom reports many cases of dysentery and the other none. Yet, we know from general observations among ourselves, our families, neighbors, and communities that diarrhea is one of the commonest symptoms of illness in the human race. For instance, how many of you expect to return to your homes and remain there for twenty-four hours without having a diarrhea complex, at least one or two extra stools?

An indication of the size of the problem of diarrhea is the resulting mortality interpreted in the light of what is known about fatality. In the 1946 Vital Statistics Report for the United States[3] a total of 1,395,617 deaths was reported in this country. Of this number 9,042 or slightly under 0.7 per cent were listed as being due to bacillary dysentery, amebiasis, diarrhea, and enteritis. Thus in the United States the symptom of diarrhea should mean to us a rather large number of deaths. In ten Central Southern states in the same year there was a total of 263, 462 deaths of which 2,891 or 1.09 per cent were due to this group of diseases. These states consisted of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Texas. The relative importance of the diarrheal diseases is emphasized further by the fact that in these ten Southern states in 1946, when there were 2,891

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diarrheal deaths, there were only 1,972 deaths due to typhoid, scarlet fever, pertussis, diphtheria, malaria, measles, and poliomyelitis combined. Compare, if you will, in your own minds the effort and expense going toward control of this group of seven diseases with the specific effort directed at control of the diarrheas. Possibly more specific concern and effort directed at the known causes of the transmissible diarrheas and food poisonings would be a fruitful field of public health endeavor. In these ten Southern states the death rates from diarrhea and enteritis range from a low of 4.6 per 100,000 population in Mississippi and Arkansas to a high of 14.5 in Texas, while the death rates for amebic and bacillary dysenteries range from a low of 0.4 in North Carolina to a high of 3.6 in Texas.

A review of the literature indicates that of all the causes of diarrhea, bacillary dysentery, amebiasis, staphylococcus food poisoning, Salmonella food poisoning, and chemical food poisoning are the chief causes of acute diarrhea and that amebic infection is one of the leading causes of chronic diarrhea. Again there are no irrefutable facts to show the amount of illness being caused by all or any one of this group of disease processes. It is believed by the writer that roughly 75 per cent of all diarrheas are due to this group of causes, although no specific studies can be pointed to which would prove this.

Bacillary dysentery is caused by many cultural types of bacillus. The results of infection with these organisms vary from no manifestations whatever, with the only sign being a temporary carrier state, through all degrees of severity to the rapidly fulminating case. Some will have only a short period of diarrhea with no other manifestations; others will have abdominal pain with diarrhea and slight fever for a day or so; others will have profuse diarrhea ushered in by chills and fever, nausea, and vomiting, and continuing for as much as ten days to two weeks with severe toxic symptoms. This variation in results of infection is due to variation in dosage, type and virulence of the bacillus, and specific and general resistance of patients. All of these factors are quite variable from one individual to another, in the different communities, and in endemic versus epidemic dysentery. These are extremely important epidemiologic factors in considering control.

Felsen[4] points out that although typhoid fever has shown a marked and consistent decline for many years, bacillary dysentery has probably increased. There has been some decline in death rates due to diarrheas but no more than can be accounted for in improvement in therapy. It is doubtful that there is real evidence of an appreciable decline in bacillary dysentery infection in the South.

The studies of Watt and Hardy[5] have been the outstanding attempts to determine the frequency of occurrence of bacillary dysentery infection in normal population groups and the results of these infections as indicated by diarrhea over a period of one year. Their findings seem of greater significance than all the half-truths gathered by morbidity reporting and studies of mortality. Their studies included areas in Georgia, New Mexico, and Puerto Rico and both white and colored races. Among their significant findings were:

(1) The average prevalence of bacillary dysentery infection was 11 per cent in New Mexico, 4 per cent in Puerto Rico, 3 per cent in Georgia, and 0.1 per cent in New York City.

(2) The total annual estimated morbidity from diarrheal diseases was 60 per cent in Puerto Rico, 48 per cent in New Mexico, and 20 per cent in Georgia.

(3) There were 9.1 per cent convalescent or passive carriers for each current symptomatic case with the younger children showing much greater inclination to manifest symptoms when the organisms were found.

(4) There was considerable tendency to seasonal variation in clinical diarrhea but much less such variation in frequency in infection.

(5) This study indicated that the frequency of diarrhea and infection was in general in inverse ratio to degree of environmental and personal cleanliness.

Some may say that these facts present insurmountable problems. Was the same feeling present years ago about typhoid fever, syphilis, tuberculosis, and other diseases which have rapidly declined? It should be a challenge which should stimulate similar efforts directed at this problem, such as have been effective in other diseases. Shall we, as public health leaders, come forward with a solution to this, another of the larger public health problems?

Amebiasis is a common parasitic disease in the South which is a part of the diarrhea problem. The diarrhea complex in amebiasis is probably the least frequent manifestation of infection. In recent years much evidence has accumulated to show that it is the cause of a wide variation of vague and indistinct abdominal and constitutional complaints without the intermittent bloody diarrhea and tenesmus.

Again in this disease reported morbidity and mortality statistics tell us nothing about the size

of the problem and those who interpret them literally are being woefully misled. As one responsible in gathering morbidity data, I know that the diagnosis of amebiasis is made in only a small percentage of cases, and of the diagnoses made not a large percentage is reported through channels. In reviewing the literature the lowest percentage infection found by survey methods was 2.8 and the reported incidence of amebiasis ranges up to 30 or 40 per cent. One clinic group in Mississippi reports 8 to 15 per cent infection in routine clinic admissions. Manson-Bahr[6] lists the findings of many investigators who determined that the incidence of amebic infection in various groups ranged up to 45.4. Faust reported 27.9 per cent of a group studied by him in New Orleans in 1930 to have the cysts. It is probable that the incidence of amebiasis in the general population in the South ranges somewhere above 8 per cent and some observers feel that few, if any, people are infected without showing one or more of the varying abdominal or constitutional complaints.

Although the extent and seriousness of this problem is not known, there is obviously enough evidence of its seriousness to justify a long-term study of it in a representative population. Possibly the Communicable Disease Center of the Public Health Service would be the logical group to undertake such a study. It might be comparable to the study of Watt and Hardy[5] on bacillary dysentery except to include a more thorough study of clinical symptoms which might be attributable to this parasite. The cause of much of the so-called indigestion, abdominal distress, intestinal disorders, and general constitutional symptoms not otherwise explained may be found to be unrecognized amebiasis.

Staphylococcus food poisoning and salmonellosis are frequent causes of diarrhea and should be of increasing concern. Chemical and plant food poisonings along with botulism are of some consequence in this group, but apparently by far the greatest share of morbidity resulting from this group is derived from staphylococcus food poisoning and Salmonella infection.

According to Dack:[7]

> "Staphylococcus food poisoning is probably the commonest type of all food poisonings although we have no knowledge of the number of cases occurring annually."

When one considers that staphylococcus is found in abundance in nature, particularly on human skin and in the nose, throat, and mouth, and realizes the increase in the amount of food prepared commercially for use without further attention, one should expect an increase in the amount of staphylococcus enterotoxin poisoning. It is probable that there has been an actual increase in addition to an increase in outbreaks recognized. It is further probable that this increase will continue in proportion to the increase in the proportion of ready-made foods dispensed unless more attention is paid to the processing and serving of foods. It is probably occurring everywhere in sporadic cases and in small family and community outbreaks without being recognized.

Some of the larger outbreaks are being recognized with increasing frequency. Two examples of recent date in Mississippi illustrate potentialities of this problem. One day at noon a train crew of four, with five other individuals, ate late lunch at a small town cafe. The lateness of their meal required substitution of precooked ham for beef on the regular meal. The last of this group finished his meal at about 2:30 P.M. Between 3:30 and 5:30 P.M. all nine individuals were seized with acute nausea, vomiting, abdominal cramps, and profuse diarrhea with increasing prostration and subnormal temperature. The acute episode lasted for six to twelve hours and convalescence for two to five days. A larger outbreak of 130 cases in ten north Mississippi counties followed a bakery route out of a Memphis concern. The vehicle was coconut cream pie from which staphylococci were easily isolated. The pies were distributed Saturday. Illness began to occur Saturday night and new cases continued to occur through Sunday and Sunday night. Symptoms, incubation, and duration were as above described except a much greater variation in severity.

Dack and others indicate that staphylococcus poisoning is most commonly due to cream pastries and pies and pork products, but many items of food have been incriminated including milk and milk products, gravies, sauces, and dried meats.

The alert public health personnel in any area will certainly find evidence of sporadic cases and outbreaks of staphylococcus food poisoning. If they look for it they will also find many reasons for it which are amenable to public health control to a great extent. The postnasal drip, pimple on the skin, or minor infection on the finger are of little consequence to the victims but may be like an atomic explosion to the community intestinal tract.

Salmonella infections are obviously a part of the picture puzzle of diarrhea. This comprises a growing large group of types formerly known as the paratyphoid bacteria. Some of these types have their reservoir primarily in man while most of them are

common in many warm-blooded animals and are pathogenic to them including swine, fowls, cattle, and rats and mice. Most of these types when swallowed in sufficient numbers by man will produce nausea, vomiting, abdominal cramps, diarrhea, and frequently fever. These symptoms vary markedly depending upon the type and quantity swallowed and individual specific and general resistance. While the incubation period for staphylococcus poisoning is near three hours, that of salmonellosis is much longer, ranging from five to seventy-two hours. This again depends upon the type and dosage of the organism swallowed.

It is probable that there is much more of this infection in each community than the recognized outbreaks indicate. Galton and Hardy[8] studied the occurrence of salmonellosis in Florida over a five-year period. They cultured 81,174 routine stools mostly from food handlers and found 1,256 cultures positive for one or more Salmonella types. This is 1.5 per cent incidence of infection. This human reservoir together with the known animal reservoirs including dogs, cats, rats, swine, fowl, birds, and so on, makes frequent symptomatic infection in the general population quite probable.

Another probable cause of diarrhea has received increasing attention in the last few years. Many of you have probably observed many cases of diarrhea in which no cause could be determined. In Mississippi there have been many instances called to my attention in which the predominant symptom would be diarrhea with some nausea lasting from one to seven days. These instances seem to be most common in October and November and are called to our attention as a result of absenteeism from school. Some stool cultures of these have failed to indicate pathogenic bacteria. From the school child it seems to spread through family groups rapidly. This is probably the thing which has been referred to as X, and so on. Smillie, Howitt, and Denison[9] report study of such an epidemic in which 40 per cent of the population was ill. In this epidemic the secondary attack rate was 43.7 and there was no evidence that food, milk, or water played a part in its spread. No pathogenic bacteria were isolated and no virus could be identified. These and many other bits of evidence point to an unknown cause of much of epidemic and sporadic diarrhea occurring in this country.

In conclusion, it is believed that the problem of diarrhea is of great importance to the people of the nation and particularly of the South because of the amount of illness and death it causes and the cost of self-medication and loss from work. It is further believed that much of this problem will yield to public health control even on the basis of present knowledge. With the effectiveness of newer chemicals and antibiotics it is probable that their use in control could become an efficient part of an intensified over-all effort directed at this problem. It should be obvious that the incidence of this symptom complex will tend to increase from all causes with the increased congestion of the population unless more concerted efforts are put forth at control. The general methods of control apply well to all the causes and will not be listed here. What we need to do with this problem is to recognize it as serious and then get to work upon its solution as has been done with many other problems. The incidence and severity of all of these causes of diarrhea are dependent upon the size of the stream of infectious and toxic material flowing within the community and this can be favorably influenced by the application of knowledge at hand.

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DISCUSSION (*Abstract*)

Dr. Albert V. Hardy, Jacksonville, Fla.—The mortality from diarrheal diseases through the years has been from five to ten times that of typhoid fever. There has been much public health concern for typhoid but very little for the diarrheal diseases. I join with Dr. Gray in urging that we re-evaluate the importance of our problems and acknowledge that the prevention of mortality and morbidity from diarrheal diseases has relatively high importance.

The basic difficulty, as I view it, is that the diarrheal diseases are commonly inadequately diagnosed. As a cause of death we accept "diarrhea and enteritis." This means only that the major symptom prior to death was diarrhea. Where else do we find causes of death indicated by the statement of a major symptom? Admittedly there are also the dysentery classifications, but in how many of these fatal illnesses is an etiologic diagnosis securely established? The infectious diarrheal diseases, I suggest, are the most inade-

quately and inaccurately diagnosed of all infectious diseases. Admittedly, present knowledge is far from adequate, but bacteriologic diagnostic procedures, if effectively applied, would properly identify most Shigella and Salmonella infections. The problem is not so simple as in typhoid, since the Shigellae die rapidly in feces. They are isolated best from fecal swab specimens taken directly from the patient and planted immediately on appropriate culture medium. We in the public health laboratories must work more closely with the hospital and clinical laboratories in which the initial isolations can be obtained. The public health laboratory should do the detailed cultural studies necessary for accurate bacteriologic diagnosis.

Dr. Gray mentioned the animal sources of the common Salmonellae infections. He named several animals as possible sources. While data are incomplete, recent and unpublished findings in Florida suggest that our best animal friend and pet, the dog, may have first importance as a source of sporadic diarrhea due to Salmonella. Obviously, fecal pollution could be spread readily from dog to child.

Treatment warrants comment if only to emphasize the value of sulfonamides in most Shigella infections, the availability of specific amebicides, and the as yet inconclusive data on the value of aureomycin and chloramphenicol in diarrheas due to Salmonellae. These variations in specific therapy urge again the need for better diagnoses.

STUDIES OF PLASMA QUINIDINE LEVELS IN RELATION TO THERAPEUTIC EFFECT AND TOXIC MANIFESTATIONS*

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Although quinidine has been recommended since 1914 for the treatment of cardiac arrhythmias,[1] there has never been agreement regarding the indications for the drug and a treatment regimen which constitutes a proper therapeutic trial.

Contraindications to quinidine therapy which are frequently mentioned include advanced age of the patient, long standing auricular fibrillation, severe conduction defects, cardiac enlargement, cardiac failure, and subacute bacterial endocarditis. However, there is no conclusive proof that the existence of any factor other than the history of a severe reaction to the drug should prevent the use of quinidine. In 1947, McMillan and Welfare[2] reported a series of 50 unselected cases of chronic auricular fibrillation in which 44 were restored to normal rhythm. Their conclusions with which we agree were that the existence of this arrhythmia increases the discomfort of the patient and may further contribute to his cardiac insufficiency, and that the likelihood of the occurrence of embolic phenomena is greater in patients fibrillating than in those restored to a sinus rhythm.

No definite rules have been established regarding the administration of quinidine, and recently the trend has been toward large doses which previously would have been considered unsafe. Experience with quinine, an optical isomer of quinidine, has indicated that a considerable variation of the plasma concentration of this drug occurs in individual patients despite similar dosage schedules. Since the method of Brodie and Udenfriend[3] for the determination of the plasma content of quinine can readily be applied to the determination of quinidine, it was felt that an attempt to correlate the therapeutic effect and toxicity of quinidine with the plasma level might provide a rational method of therapy for the reversion of auricular fibrillation to a normal sinus rhythm.

Material.—Forty patients with auricular fibrillation were studied. Thirty-four were patients with chronic auricular fibrillation and 6 were patients with transient auricular fibrillation.

In the former group the duration of the disorder varied from months to years. The majority had experienced episodes of congestive failure and had received digitalis prior to the administration of quinidine sulfate without reversion to a normal rhythm. By the criteria established by the American Heart Association, the condition responsible for the chronic auricular fibrillation in 13 patients was rheumatic heart disease; in 17 patients, arteriosclerotic heart disease which in 8 instances was associated with hypertension; in 3 patients, thyrotoxicosis; and in 1 patient, neoplasm involving the heart.

Method of Study.—All patients were hospitalized, and electrocardiograms were made prior and subsequent to therapy. Renal function was evaluated by the urea clearance method. Quinidine sulfate was administered orally, usually every four hours, until the desired therapeutic effect was obtained or toxicity encountered; the patients were seen several times daily to evaluate therapeutic progress or to detect toxicity. Over 300 blood samples were obtained, and the plasma quinidine concentration was determined by the photofluorometric method of Brodie and Udenfriend. The urinary excretion of

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quinidine was estimated in 6 patients by the method of Kyker and McEwen.[4]

Preliminary studies indicated that maximum blood levels are reached one to three hours after oral administration and begin to decline in four hours, and that the time of maximum response does not vary with the size of the dose. As a basis for comparison samples were obtained routinely one hour following ingestion of the drug, although it was realized that this might not necessarily represent the peak level attained.

RESULTS

Sinus rhythm was re-established in 20 out of 34 cases of chronic auricular fibrillation (59 per cent reversion) and in all 6 cases of transient auricular fibrillation. These results would indicate only moderate therapeutic success; however, if the 3 patients with thyrotoxicosis, a condition in which reversion is difficult until the etiologic factor has been corrected, and 4 patients whose drug was prematurely discontinued for reasons beyond our control be eliminated, a beneficial response was achieved in 74 per cent of the remainder in whom success might reasonably be expected.

The mean plasma quinidine content of the samples obtained when sinus rhythm was established in the entire group of patients with chronic auricular fibrillation was 10.0 mg. per liter and ranged from 3.9 mg. per liter to 18.8 mg. per liter. These levels were achieved with a dosage schedule which varied from 0.2 to 1.0 gram of quinidine sulfate every four hours. Only 3 patients reverted to a normal sinus rhythm with a plasma level less than 7 mg. per liter, and over 50 per cent of the patients required a level in excess of 9 mg. per liter. A plasma concentration of 21.2 and 31.2 mg. per liter was attained in 2 patients who failed to show any alteration of rhythm or toxicity.

No correlation was found between the ease of reversion and the duration of fibrillation (*Table 1*) or the age of the patient (*Table 2*). With one exception all failures were in patients in whom fibrillation had existed three years or less. Three patients who had been known to have an abnormal rhythm for 10, 12, and 15 years reverted readily when levels of 10.5, 9.4 and 12.0 mg. per liter were attained. The mean plasma level in the group of 8 of 9 patients who had been fibrillating for over three years at the time of reversion was 10.0 mg. per liter.

A division of cases according to etiology (*Table 3*) revealed that 7 of 11 patients with rheumatic heart disease reverted with an average level of 10.7 mg. per liter when given an adequate therapeutic trial, and that 12 of 15 patients with arteriosclerotic heart disease reverted with an average level of 9.8 mg. per liter. None of the patients with thyrotoxicosis reverted. The 6 patients with transient auricular fibrillation were quickly restored to a normal sinus rhythm with an average plasma concentration of 3.4 mg. per liter.

The size of the dose of quinidine proved to be no criterion for estimating the plasma level since a wide range of plasma drug concentrations was

QUINIDINE THERAPY

Duration	Patients		Plasma Level
	Treated	Reverted	Mg./Liter Range
< 1 Mo.	4	4	6.0-18.8
1 - 12 Mos.	8	6	4.5-10.4
1 - 3 Yrs.	6	2	14.0
3 - 15 Yrs.	9	8	3.9-12.0

Table 1

The relation between the duration of chronic auricular fibrillation in arteriosclerotic and rheumatic heart disease and the plasma level of quinidine at time of reversion to a sinus rhythm.

QUINIDINE THERAPY

Age	Patients		Plasma Level
	Treated	Reverted	Mg./Liter Range
20 - 29	2	0	—
30 - 39	3	1	10.4
40 - 49	3	3	4.1-14.0
50 - 59	4	4	6.0-18.8
60 - 69	9	8	3.9-14.3
70 -	5	3	7.1-11.3

Table 2

The relation between age of the patients with chronic auricular fibrillation due to arteriosclerotic and rheumatic heart disease and the plasma level of quinidine at the time of reversion to a sinus rhythm.

QUINIDINE THERAPY

Etiology	Patients		Plasma Level Mg./Liter	
	Treated	Reverted	Range	Mean
Rheumatic	11	7	6.0-18.8	10.7
Arteriosclerotic	15	12	3.9-14.3	9.8
Thyrotoxic	3	0	—	—
Transient	6	6	1.2- 6.0	3.4

Table 3

The relation between the etiology of the underlying heart disease in auricular fibrillation, the effectiveness of quinidine in inducing reversion, and the plasma level at the time of reversion to a normal sinus rhythm.

obtained in different individuals receiving the same dose. The administration of 0.3 gram every four hours for three days produced a maximum level of 2.5 mg. per liter in one individual and 10.8 mg. per liter in another. No explanation could be derived from consideration of body size or renal function as estimated by the urea clearance method.

DISCUSSION

Relation of Plasma Level to Dose.—A few generalizations from the data do seem justifiable. In a given individual the magnitude of the plasma concentration varied directly with the size of the dose. If repeated constant doses were given at appropriate intervals, a cumulative effect was noted over a period of three to five days at which time a plateau was reached (*Fig. 1*). If the size of the dose was then increased, the plasma level was raised appreciably.

In an occasional patient the administration of constant doses of the drug in a total amount as great as 9.6 grams over an eight-day period failed to produce a level which was found in others to be necessary for a therapeutic effect. Failure to revert was attributed to a poorly arranged therapeutic program. In the light of subsequent experience, the administration of the same amount of quinidine over a shorter interval with progressive increases of the individual doses might have been effective. Such cases demonstrated that it was the size of the individual dose rather than the total daily or weekly dose that was most important in obtaining a satisfactory plasma concentration.

As would be expected from the fact that peak

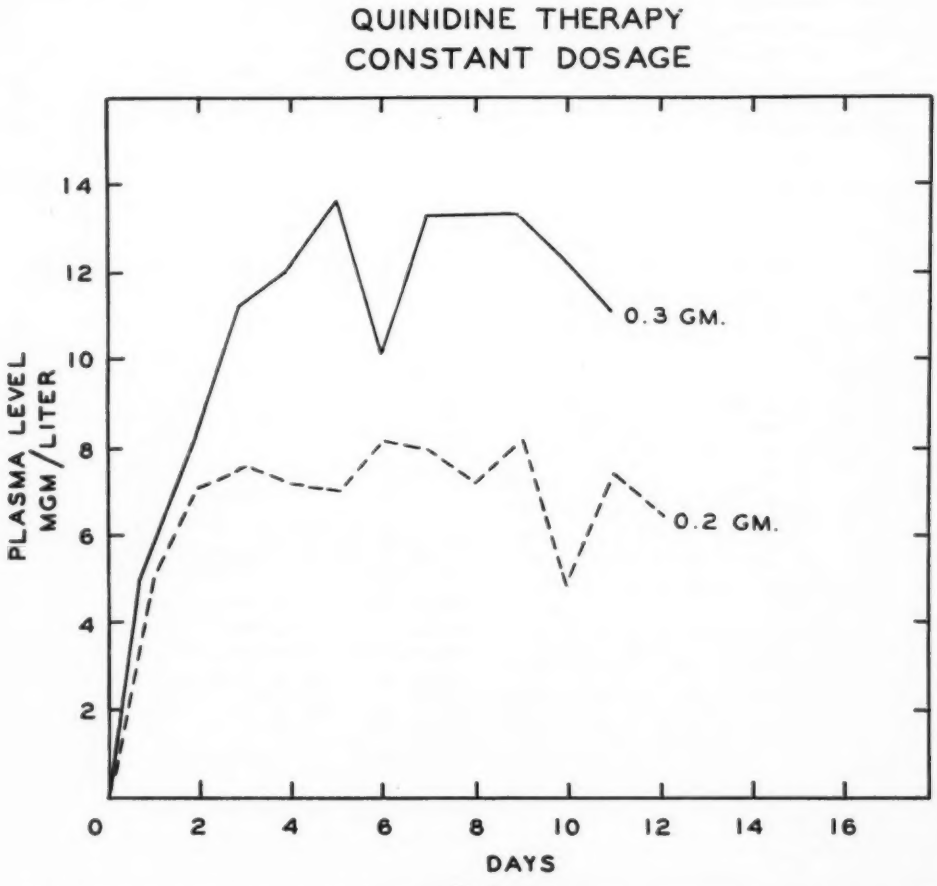

Fig. 1

Serial plasma levels of quinidine in two patients obtained one hour after administration of a constant oral dose of the drug on a four-hour schedule.

levels occur one to three hours after administration of the drug, a rapidly rising plasma concentration was noted when the doses were gradually increased on a four-hour schedule (*Fig. 2*). Although quinidine was not given in this study at intervals of less than four hours, two- or three-hour schedules should produce a maximal cumulative effect and might be a desirable procedure in the management of acute arrhythmias when danger from continuation of the abnormal rhythm is greater than the danger of overdosage. In patients receiving the drug at six-hour intervals the cumulative effect was slight.

Physiologic Disposition.—In 5 patients whose medication was discontinued, a marked drop in plasma quinidine concentration was noted in 24 hours, and virtually none was detectable in 36 hours. This would imply that if the status of quinidine therapy in a patient were unknown, withdrawal of treatment for two days should enable the physician to renew therapy without fear of a cumulative effect from previous medication.

The urinary excretion of quinidine was measured in 6 patients, and only 6 to 20 per cent of the total daily dose could be recovered. Since it has been demonstrated that absorption of the drug from the gastro-intestinal tract is essentially complete,[5] it appears that the drug is disposed of by the body through some metabolic alteration.

Toxicity.—In all probability the toxic effects of quinidine have received undue emphasis. In the past it has been customary to designate these manifestations under four headings, and an attempt to correlate the appearance of toxic symptoms with plasma concentration was possible in only the last of the following groups:

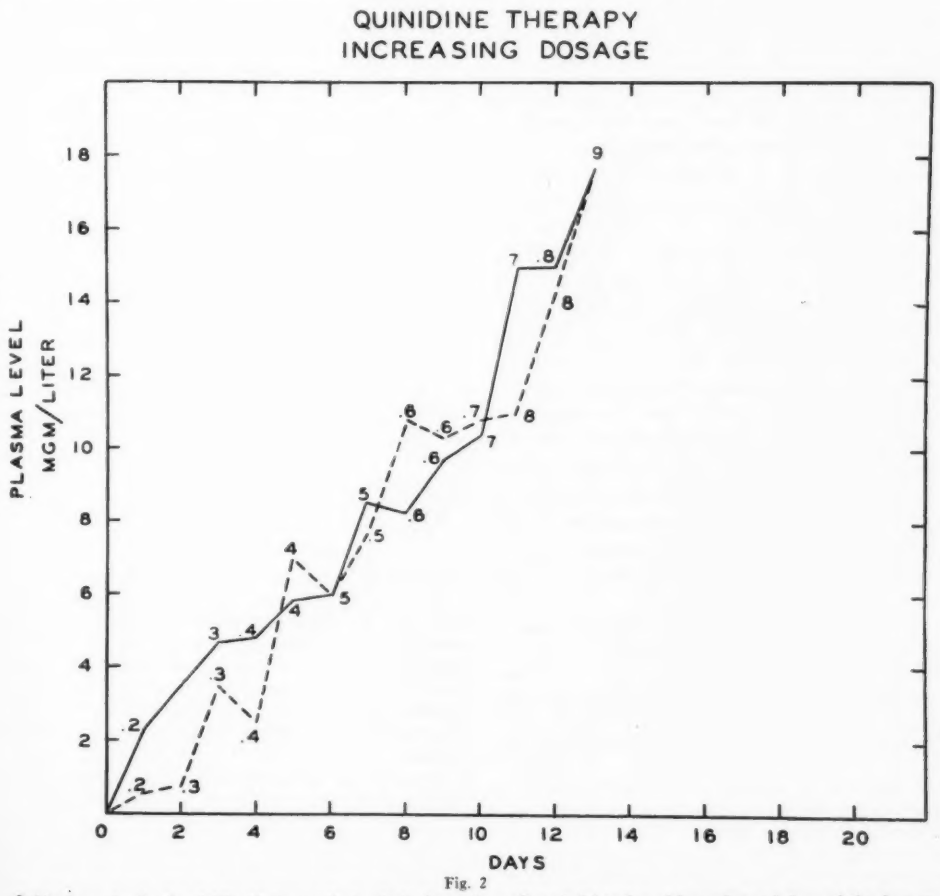

Fig. 2

Serial plasma levels of quinidine in two patients obtained one hour after administration of increasing oral doses of the drug on a four-hour schedule.

(1) *Idiosyncrasy.*—Symptoms of collapse with cardiorespiratory failure may occur after the initial dose. The dose need not necessarily be large, and plasma levels would have little significance. This did not occur in our series.

(2) *Precipitation of Ventricular Tachycardia or Fibrillation.*—This was not observed by us.

(3) *Embolic Phenomena.*—We feel that this possibility has been overemphasized and is no more likely to occur with reversion to normal rhythm than with continuation of auricular fibrillation. Only one patient in this series had an embolus, but this occurred prior to the initiation of quinidine therapy.

(4) *Reactions Following "Overdosage."*—Symptoms including anorexia, nausea, vomiting, diarrhea, malaise, and tinnitus have often been considered due to overdosage. These manifestations occurred in one-third of the patients in our series and usually were mild (*Table 4*). The plasma levels at which they became apparent were well within the required therapeutic range. A decrease in the dose to prevent these symptoms would have met with failure in alteration of the rhythm of these patients. In one patient a level of 31.2 mg. per liter was attained without clinical subjective evidence of toxicity. Another patient complained of mild tinnitus and malaise while plasma levels were in the range of only 8 to 10 mg. per liter; however, therapy was continued, and his symptoms of "overdosage" cleared although a peak level of 21.2 mg. per liter was reached subsequently.

In this series it appeared to be the rate of rise of the plasma concentration rather than the actual level that was responsible for toxic manifestations.

Gastro-intestinal symptoms of sufficient magnitude to justify withdrawal of the drug were observed in two of three patients with thyrotoxicosis. Although these symptoms may have been due to thyrotoxicosis, they were not apparent until quinidine therapy had been initiated, and plasma concentrations of 6.0 and 9.5 mg. per liter had been reached.

TOXICITY DUE TO QUINIDINE

Manifestation	Frequency	Plasma Level Mg./Liter Range
Gastro-intestinal	8	5.6-17.5
Tinnitus	6	3.0-18.8
Malaise	3	8.3-11.2

Table 4

The relation between the frequency of toxic manifestations and the plasma level of quinidine when symptoms appeared in 40 patients with auricular fibrillation.

SUMMARY

(1) Plasma concentrations of quinidine have been studied in relation to oral dose, therapeutic effect, and toxicity of 40 hospitalized patients with auricular fibrillation.

(2) The effective plasma concentration appeared to be in the range of 5 to 15 mg. per liter in patients with arteriosclerotic and rheumatic heart disease regardless of the age of the patient or the duration of persistent fibrillation.

(3) Patients with transient auricular fibrillation reverted more quickly than any other group with an average plasma level of 3.4 mg. per liter.

(4) It is recommended that quinidine sulfate be given orally at least every four hours with dosage increments of 0.2 gram one or more times daily. No patient should be considered a therapeutic failure until the plasma quinidine concentration exceeds 15 mg. per liter.

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DISCUSSION (*Abstract*)

Dr. J. Harold Kotte, Cincinnati, O.—It has been generally agreed that the dosage of quinidine used in the treatment of cardiac arrhythmias was an empirical one and not one based upon any scientific evidence of tissue concentration of the drug. This may account for many of the treatment failures which have been noted in the past. For example, some physicians feel that it has been very difficult to convert chronic auricular fibrillation to normal rhythm, and others that it can be achieved in a high percentage of cases.

Similarly, the dosage schedules vary considerably. Some individuals advocate high doses at short intervals, and some space the doses at wider intervals. I believe any attempt to quantitate the dosage, as has been done in this study, should meet with considerable enthusiasm, because it would place quinidine therapeutics on a much sounder and more

scientific basis. Unfortunately, there are many gaps in our knowledge of the physiologic distribution in tissues and the activity there of quinidine.

There appears to be no really strict correlation as yet proved between plasma levels and cardiac activity, nor does there seem to be any clear evidence to support the fact that achieving really high concentrations in cardiac tissue yields any higher percentage of therapeutic results. This has been studied in animals. I believe in dogs the concentration of quinidine in the heart appears to be much higher than it does in plasma for any given level, and so far there does not seem to be any really strict correlation between these high levels and any therapeutic activity within the heart; as a matter of fact, some have pointed out that the higher the concentration is, perhaps the lower the degree of therapeutic effectiveness.

The study of Drs. Yount and Rosenblum has served to emphasize and explain several points which have been apparent from the clinical point of view. They have indicated an explanation why it is best to give large doses of the drug in short periods of time. As you have noted, the plasma levels increase considerably if the doses are given at four-hour intervals or oftener, due to an additive effect of successive doses. There is an occasional patient who fails to revert from auricular fibrillation, even with quite satisfactory blood levels. This appears to be a matter of individual sensitivity to the drug, and that is the sort of result one finds in any type of biologic experiment using drugs in different individuals.

I should like to ask the authors several questions. I should like to find out whether in each instance, or in the majority, when rhythm has reverted from auricular fibrillation to normal, the plasma levels recorded have been those obtained at the time of reversion. Also I wonder how long it would be necessary to keep an individual at a level of 10 mg. before his rhythm might revert to normal, or how long it would be necessary to keep him at that level before attempting to raise his plasma concentration to, say 12 or 14 or 15 mg.

I also wonder if they have had any experience with plasma concentrations in patients with other types of arrhythmias, with auricular flutter, for example, which fails to revert to normal rhythm with digitalis, or with ventricular tachycardia. Apparently in some other reported instances the plasma levels required to revert paroxysmal arrhythmias are not nearly so great as those required in this series.

Dr. Edgar Hull, New Orleans, La.—I have had some experience with the intravenous use of quinidine. We use quinidine sulfate, which can be dissolved in a 1 per cent solution. I think it is important that we use a weak solution, and, fortunately, when we use quinidine sulfate, we cannot get a stronger solution. This prevents our giving it too rapidly. Ten cc. will contain only 0.1 gram of quinidine, and we have found that this small dose may revert ventricular tachycardia or auricular fibrillation to a normal mechanism. Usually one needs to give a larger dose, perhaps 50 cc., which is 0.5 gram.

Dr. A. A. Herold, Shreveport, La.—I should like to ask the essayist what experience, if any, he has had with the intravenous use of quinidine in fibrillation. I recently had a patient whose fibrillation evidently started from a gastrointestinal attack. She had had some previous symptoms of cardiac irregularity, and she was so nauseated that we could not give her quinidine by mouth. We had some of the experimental quinidine in solution, and although I gave it extremely slowly, and my assistant watched the pulse, it gave us quite a fright. The cardiac mechanism apparently stopped temporarily and, of course, I stopped the intravenous injection. It came back in a few minutes and resumed a normal rate, and the patient made an uneventful recovery. Of course, the condition and the after-effect were so bad that it was impossible to obtain an estimation of the concentration at that time, and I should like to know from the essayist if he has had any experience along that line.

Dr. E. Sterling Nichol, Miami, Fla.—I should like to ask the essayist whether he has noted that the hyperthyroid patient tolerates large doses of quinidine as a rule. It is generally felt that such cases are less likely to have toxic manifestations from quinidine, but the reverse situation I think has never been definitely established.

It has been my impression over a period of years that the true myxedema case tolerates rather low doses of quinidine. It might be interesting to determine blood levels of quinidine in hyperthyroidism and in myxedema.

Has the gastric acidity any effect upon the absorption of quinidine? Repeatedly I have seen patients with definite gastro-intestinal manifestations from quinidine who, when antacids were given, recovered from the toxic manifestations, and I wonder whether this is due to lack of absorption after the use of the antacid.

Dr. Yount (closing).—We have no information regarding the influence of gastric acidity upon the absorption of quinidine. Work with quinine has indicated that the administration of alkalies decreases urinary excretion and acids increase urinary excretion of this drug.

We found that our few patients with hyperthyroidism tolerated quinidine poorly. It has been the experience of others that patients with myxedema tolerate quinine poorly. No patients with myxedema were in our series.

As to Dr. Herold's question about intravenous quinidine, we have not administered the drug in this manner. To a few patients we have given quinidine intramuscularly and have had no reactions. Plasma levels following the intramuscular administration of the drug begin to rise within 15 minutes and are quite high within an hour.

We are working upon the answer to Dr. Kottę's questions and are now studying tissue concentrations of the drug. The data available at present are limited.

Followups on our patients were unsatisfactory, and we have only meager information regarding maintenance doses. A few patients we allowed to return to fibrillation by discontinuing quinidine. When treatment was again resumed their reversion level corresponded closely to the initial reversion level. This could have been only a chance occurrence.

I should like to mention that the determination of the quinidine plasma concentration was by a photofluorometric method and, if an instrument is available, the procedure is simple. The plasma proteins are precipitated with metaphosphoric acid and the supernatant fluid is compared in the photofluorometer with a standard quinidine solution.

ERYTHEMA CHRONICUM MIGRANS AFZELIUS WITH MENINGITIS*

By SVEN HELLERSTROM, M.D.
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For the first time the combination, erythema migrans Afzelius and meningitis, was described in 1930 by the present writer.[1] Pending further evidence the connection between the eruption and the meningitis, which was lymphocytic in that case, was considered obscure. Since I have met with another case of the dermatosis associated with fever and signs of meningitis, and an additional instance with pronounced meningitic symptoms was recorded by Gelbjerg-Hansen[2] in 1945, it stands to reason that erythema chronicum migrans Afzelius and meningitis cannot very well be regarded as a fortuitous concurrence. There being no doubt that erythema practically always results from a tick bite, this may reasonably be expected also to give rise to the meningitis.

In the course of the years an ever increasing number of cases has been reported, in which after a tick bite both erythema and subsequent meningocerebrospinal symptoms had been observed. For example, in 1946 Henry Salde[3] described a case of erythema chronicum migrans with lassitude and weakness in the affected leg. Neurologic examination disclosed a slight decrease in the gross force of the femoral extensors as well as some atrophy, but otherwise no indications of paralysis or disturbances in sensibility. Lasegue's sign was negative in either leg, and there was no muscular rigidity at the back of the neck. Spinal puncture was unfortunately refused by the patient. The erythema definitely subsiding after roughly three months, the lassitude and weakness in the leg also disappeared. Symptoms of polyradiculitis following a tick bite seem to be very rare and hitherto described only by Robert Birg[4] and H. C. Bode.[5] Bode's patient recovered but after a subsequent tick bite once more developed symptoms suggestive of injury to the central nervous system, at that time presenting the clinical aspect of grave encephalitis with bulbar symptoms. Recently Dalsgaard-Nielsen[6] and Aage Kierkegaard recorded the case of a woman aged 35, who after a tick bite followed three weeks later by erythema chronicum migrans, developed leukocytic meningitis with a very benign course, and with mild radicular pain. The meningitis commenced after 11 weeks and was initially accompanied by a slight rise in temperature.

On account of our own and other observations, for a year or two at the Dermatological Clinic we have made it our rule as far as possible to perform spinal puncture in cases of erythema migrans, irrespective of whether or not meningoencephaloradicular symptoms are present. Out of five cases examined with this procedure, in one we observed appreciable, if slight, changes in the spinal fluid, to-wit: Pandy (+), Nonne (+), total proteins 17.88, globulin 7.09, albumin 10.79, globulin-albumin ratio 0.66, cells 16.3 per cubic millimeter; mastic test, slight flocculation in the two first tubes; Wassermann, Kahn, and Meinicke's second clarification tests, negative. The patient in question, a woman aged 50, had no subjective nor other clinical symptoms of meningitis. She was treated with "neoarsphenamine" (E. Hollström), but proved intolerant to this drug, which was therefore discontinued. Subsequently Hollström used penicillin in oil and wax with complete subsidence of the erythema after two injections of 300,000 units each.

To illustrate, *inter ali* the beneficial action of penicillin on erythema migrans Afzelius associated with meningitis, I propose here to give a report on an instructive case, the record of which was very kindly made available to me by the senior physician Bo Bäfverstedt, M.D. A man aged 23 was hospitalized January 17, 1949 to February 2, 1949 in the Dermatological Department of the Södersjukhuset (record No. 1769-1949).

The patient was employed as a telephone fitter. He mostly worked indoors, but in September each year he regularly spent three months in camps, and during October-December he has every Sunday done voluntary work cutting timber in the woods.

He has always been healthy. Pulmonary skiagrams were taken during military service in February, 1948, on account of respiratory infection. Early in December, 1948, the patient began to suffer from headache. Simultaneously a slight eruption developed in the upper portion of the right thigh. Itching and fever were absent, the temperature never exceeding 37.5° C. There was some slight giddiness. The eruption commenced with a red spot which gradually extended, subsiding in the center and spreading peripherally. For more than six months the patient had had a mild rhinitis and sore throat. About March 1, 1948 he saw the office physician and was given tablets for the headache and a cough mixture, without benefit. Since January 6, he experienced nausea immediately after meals and vomited. He was unable to retain any food whatsoever.

On January 14, 1949 he was on account of vertigo, cephalalgia (herpes zoster?), and for diagnosis, referred by the office physician to the medical out-patient service of

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*From the Dermatological Clinic of the Karolinska Institutet, Stockholm.

the Södersjukhuset. The patient then said that for a month he had had headache at the back of the skull, especially on movement, and felt dizzy. For the same period he had noticed a peculiar discoloration, 30-40 centimeters in length, on the right thigh. On examination the lesion proved not to be of the zoster type. For the previous fortnight the patient had remained in bed; since Christmas, 1948, he had been subject to vomiting, but had not had fever. From the findings on examination at the medical out-patient clinic the following might be mentioned as being of interest: a certain clumsiness and tremor in performing the finger-nose test; some muscular rigidity at the back of the neck; giddiness provoked by movements of the head; abdominal reflexes indefinite on the left side (?); on the right thigh a livid, area of discoloration, extending over 30-40 centimeters, and with poorly defined lateral margin. Urinalysis, normal; hematologic examination, normal. Sedimentation rate 2mm./1 hour on April 1, 1949. Consultation with the dermatological out-patient service of the Södersjukhuset gave the report probably erythema migrans (with systemic involvement, possible mild meningitis). Admission was advised to the Dermatological Department of the Södersjukhuset.

On admission the general condition was satisfactory with nutritional state, muscular development and color of skin normal. There was no visible edema and the subjective complaints were limited to headache.

The teeth were in good condition, tonsils small with the posterior faucial wall slightly reddened and granulated. Lymph nodes, thyroid, lungs and abdomen were all normal. The blood pressure was 120/80 and the pulse rate and rhythm were normal. The cardiac contour was normal and the heart sounds revealed no pathologic condition.

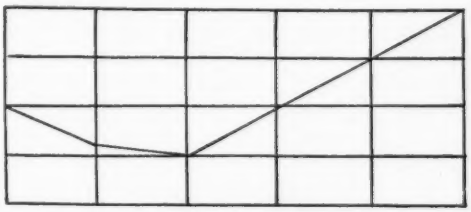
Neurological Findings.—Mentally the patient was quite clear. There was an appreciable nuchal rigidity and Lasegue's sign at 45° was positive in both legs. On the cranial nerves, the first was not examined; the ocular fundi and the visual fields were normal as were nerves 3, 4 and 6. No diplopia was present and the ocular movements were normal. The spinal nerves revealed no abnormalities, in motility or sensibility and there was no decrease in the gross muscular force which was symmetrical and satisfactory throughout. Diadochokinesia and finger-nose and heel-knee tests were normal. Romberg sign and modified Romberg test were negative. The pupils reacted well to light and in accommodation. The brachioradial, biceps and triceps reflexes were normal. The abdominal reflexes are not well elicited on the left side but the patellar, tendo Achilles and the Babinski responded normally. The spinal fluid examinations gave the results as indicated in the charts.

Comment.—In cases of erythema migrans the above markedly pathological figures will be found, with respect to the total proteins, globulin, and albumin, but the normal ratio remains (meningitis type, yet not syphilitic meningitis, the ratio as a rule also being considerably elevated in the latter condition).

Skin Findings.—Within the upper portion of the right thigh a slightly elevated, erythematous zone is noted measuring one centimeter across and extending downwards from the groin over the medial aspect of the thigh on to its anterior aspect, then on the lateral aspect turning towards the greater trochanter. There is no complete erythematous circle. In both groins there are firm, non-tender lymph nodes of pea-size. No tick bites or similar lesion is visible.

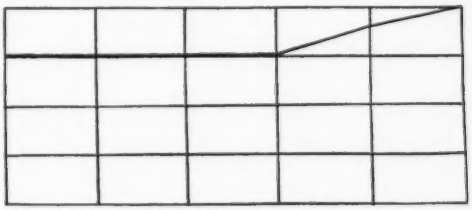
January 18, 1949. ***Pathologist's report on a biopsy specimen*** (*Dr. F. Wahlgren*).—The epidermis does not present

January 17—
Meinicke clarification test (—)
Mullers conglobation test (—)
Pandy 2+
Nonne 1+ (Strong)
Weichbrodt 1+
Total cell count 1200
Polymorphonuclears 60
Monocytes 1140
Erythrocytes 20/mm.³



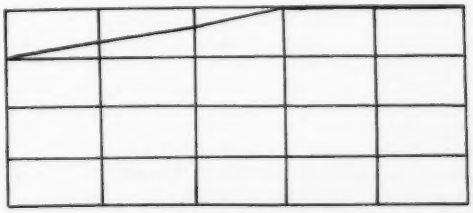
Mastic-curve, January 17

January 25—
Fluid colorless clear
Pandy (+)
Nonne, trace
Weichbrodt (+)
Cells: polymorphonuclears 22
Monos. 171
Reds 14 (fresh)



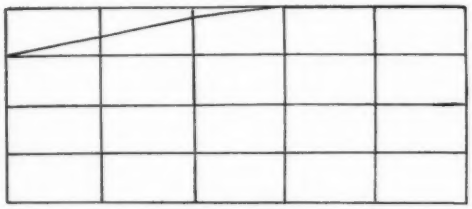
Mastic-curve, January 25

February 3—
Fluid clear
Pandy (+)
Nonne, trace
Weichbrodt (—)
Cells: polymorphonuclears 10
Monos. 42
Reds 2/mm.



Mastic-curve, February 3

February 17—
Pandy (—)
Nonne, trace
Weichbrodt (—)
Polymorphonuclears 6
Cells: 17
Reds 15
January 17—Estimation of protein fractions according to Izikowitz
Total proteins, 169.91
Globulin, 42.83
Albumin, 127.08: ratio, 0.34



Mastic-curve, February 17

appreciable changes. The papillae are flattened. In the papillary and sub-papillary layers the connective tissue is found to contain strikingly few cells. Occasionally very slight perivascular infiltration by lymphocytes is noted. The capillaries are not dilated. Within a single area also the deeper strata of the dermis show slight inflammatory infiltration encasing the vessels, skin appendages, and a fine nerve fiber.

The changes as observed are very slight and not sufficiently characteristic to allow a diagnosis to be based upon them.

January 19, 1949. *X-ray examination (Dr. Broden).*—Heart, pulsations, normal. The heart is small; its shape is not pathologic. No pathologic changes are found in the thoracic aorta. There is no evidence of pulmonary stasis.

The lungs showed normal findings.

January 20, 1949, considerable subjective improvement was noted. There was no headache. Objectively, there was no nuchal rigidity. Lasegue's sign was positive at 60° in either leg. Since his admission to the hospital the patient has been treated with penicillin.

The eruption has faded considerably, just a trace remaining of the erythema.

January 28, 1949, the oculist's report (Dr. Kornerup) showed: R = V + 0.5, L = 1.0.

Refracting media and fundi, normal. No evidence of optic atrophy.

January 28, 1949, the temperature has been normal during the entire period of hospitalization. The cutaneous and nervous symptoms have completely subsided.

February 21, 1949. *Resume at Discharge.*—The patient was admitted to the hospital with typical erythema migrans involving the upper portion of the right thigh. As regards the history, it should be pointed out that in the summer and autumn he had been exposed to insect bites. On admission there was no evidence of this kind, however. Apart from the eruption he presented conspicuous symptoms of meningitis, consisting of spasms of the nuchal muscles and a very considerable increase in the cell content of the spinal fluid. The patient was given penicillin injections. After a couple of days he was free of subjective symptoms with respect to the meningitis, just a trace of the eruption remaining. After a further day or two this also disappeared. As was to be expected, a biopsy specimen disclosed nothing but slight perivascular infiltration. Save for the penicillin injections, the only treatment was rest in bed. The spinal fluid showed gradual improvement, the findings at discharge being: polymorphonuclears 6, mononuclears 17, a normal mastic test, and insignificant changes in the protein rates. The patient was advised to continue resting at home.

The above case thus related to a man aged 23, who in the summer and autumn of 1948 had been exposed to insect bites and in addition to erythema migrans presented conclusive evidence of a predominately monocytic meningitis. The penicillin treatment instituted on the advice of the Dermatological Clinic, where the drug had previously proved beneficial (E. Hollström),[7] as early as after two days produced subsidence of the subjective symptoms of meningitis. After 11 days the last trace had disappeared of the eruption, the cell content of the spinal fluid dropping within 9 days from 1,140 to 171 monocytes per cu. mm. Estimation of the protein fractions by means of the Izikowitz procedure disclosed a marked rise in the globulin and albumin figures but a normal ratio. For further details, see the data quoted from the record.

In the Stockholm area, cases of erythema chronicum migrans are far from rare. Counting my private patients only, from 1935 to 1948 I have seen more than 30 instances of the condition. That the eruption is evoked by a tick bite is, in my opinion, a definitely established fact. Such a bite, as a rule produced by *Ixodes reduvius,* may in one and the same subject sometimes give rise to erythema, whereas it does not cause such or similar sequelae on other occasions. A patient who in September suffered a tick bite in the thigh, a fortnight later developed erythema at that site, early in November of the same year an eruption on the forearm, and on approximately the fifteenth of that month another erythema migrans around the left nipple. The patient denied having been exposed to tick bites in either of the latter sites, which might be interpreted by supposing that the site of involvement of the erythema is not strictly dependent upon the position of the tick bite. On the other hand, a tick bite may easily be overlooked. Experience has also shown that the eruption may follow upon just one particular tick bite, the subject in question having suffered tick bites both before and afterwards without any eruptions being observed.

At the present moment, there are few cases of erythema migrans with meningitis on record, four observed in Sweden and two in Denmark. In three

of the Swedish and one of the Danish cases (Gelbjerg-Hansen's), the meningitis was monocytic in type. In one of the Swedish cases, there was no rise in the cell content of the spinal fluid, and a leukocytic reaction was demonstrated in the other Danish case. Apart from these complications of erythema migrans, in both countries a case was observed with clinical evidence of radiculitis. The Danish case after the second tick bite presented also the clinical aspect of encephalitis with bulbar symptoms.

The question of whether this type of meningitis and other neurologic manifestations are due to an allergic-toxic reaction or to an infective agent of whichever kind (possessing allergizing or immunizing properties?), which is introduced into the system by the tick bite, must be left in abeyance for the time being.

The genus, *Ixodes*, comprises ticks, the best known of which is *Ixodes reduvius sive ricinus*. This as well as other species transmits pathogens such as spirochetes and piroplasmas that are apt to produce serious cutaneous diseases both in man and especially in domesticated animals. The presence of a toxic agent in the salivary glands of the ticks has been demonstrated by experimental, biological studies (Askani). When injected into animals in varying dosage, a saline extract prepared from *Ixodes* will give rise to toxic symptoms. Small doses produce tremor and vomiting, moderate ones areflexia or complete paralysis, and large doses at first prevent the coagulation of the blood, later on produce a drop in blood pressure accompanied by tachycardia, and eventually cause heart failure and symptoms of intoxication.

As regards the pathogenesis of the erythema itself, the results of investigations in 1932-33 carried out by the present writer seem to suggest that, as Afzelius had already supposed, the tick plays an etiologic part in the origination of the eruption. The evidence emerging from those studies tended to show that patients with the disease in question were supersensitive to some agent present in the body of the tick. This sensitivity to tick components was revealed by positive intracutaneous tests with tick extract. The reactions were found to be negative or attenuated within areas recently traversed by the erythematous process, owing probably to the latter's having brought about a change in sensitivity. The responses were most marked at the actual site of the eruption. In subjects without erythema migrans, past or present, intracutaneous tests with the tick extract used in these studies were negative. The results were subsequently confirmed by Dalsgaard-Nielsen and Aage Kierkegaard, who in addition failed to elicit responses in patients suffering from meningitis due to other causal factors.

Concerning the etiology of erythema chronicum migrans the following facts should be pointed out:

(1) The condition follows upon the bite of certain species of *Ixodes* (possibly also *Culex*, occasionally).

(2) In one and the same subject, a bite may sometimes cause one or several eruptions, while this or a similar effect is not produced on other occasions.

(3) Considering the large number of persons exposed to tick bites, erythema migrans is a rare result of the bite.

(4) In cases presenting two or more migrating erythemas, there is some doubt as to whether the sites of the separate erythematous circles always strictly correspond to the position of the tick bite or bites.

(5) Regional lymphoglandular enlargement has occasionally been noted.

(6) Intracutaneous tests with extract prepared from *Ixodes* species afford evidence tending to show that the area enclosed by the actual erythematous circle and its immediate vicinity differ in their allergic behaviour (Hellerström, Dalsgaard-Nielsen, and Kierkegaard).

(7) In a proportion of instances, the eruption is associated with monocytic or leukocytic meningitis, radiculitis and, occasionally encephalitis with bulbar symptoms (Hellerström, Gelbjerg-Hansen, Dalsgaard-Nielsen, Kierkegaard, *et alii*).

(8) In material taken from the eruption spirochetoid bodies have been demonstrated (C. Lennhoff[8]).

(9) As to the eruption, it is further known that injections of "iodobismitol" or arsphenamine will cause its temporary (few injections) or definite (more injections) subsidence (C. Lennhoff, E. Hollström).

(10) Both the eruption and the meningitis will readily yield to penicillin (E. Hollström, Leczinsky), but not to the sulfonamides.

(11) Both the eruption and the meningitis may subside spontaneously and are practically without exception mild in character.

(12) The following negative results deserve attention: (a) negative transmission tests in normal subjects with extract prepared from the affected skin (Preininger, Hollström); (b) failure of cul-

tures with the affected skin and spinal fluid; (c) it was not possible to demonstrate antibodies to various bacteria in the serum of patients, and the Wassermann test was negative; (d) no antibodies such as occur in cases of various virus diseases (eastern and western equine encephalo-myelitis, St. Louis encephalitis, choriomeningitis) could be demonstrated in the blood (Dalsgaard-Nielsen and Kierkegaard); and (e) the toxoplasmosis reaction was negative with blood serum (Hellerström).

On account of the negative findings as to bacteria and virus, and of the positive results of skin tests and further since Dalsgaard-Nielsen and Kierkegaard have reported a positive Prausnitz-Kuestner test and eosinophilia of the cutaneous infiltration (Gans) and blood (Gelbjerg-Hansen), these investigators are of the opinion that both the eruption and the meningitis should be regarded as allergic phenomena. To support their conception they quote the observation that the condition is apt to recur after another tick or culex bite. A thermolabile agent present in the salivary glands of the tick is held responsible for the allergic reaction.

The Danish authors thus agree with the opinion given by me in 1933, that patients with erythema migrans seem to be sensitive to some component of the tick, and that consequently the condition pathogenetically belongs in the field of allergy. By considering also the meningitis an allergic phenomenon, they advance a step farther, however.

On the other hand, I feel incapable of explaining the exceedingly powerful action of "iodobismitol" and arsphenamine as well as penicillin on the eruption with or without meningitis solely on the basis of an exclusively allergic pathogenesis. The evidence hitherto secured tends to show that the latter antibiotic will also rapidly cure well-marked meningitis supervening erythema migrans. Purely antiallergic properties, in that case directed against the alleged thermolabile substance with allergizing behavior, are not attributed to the drugs mentioned, however.

Personally I feel inclined towards interpreting erythema chronicum migrans Afzelius with or without meningitis as being the manifestation of an infective agent with allergizing properties, which is transmitted by ticks and, possibly, other insects. This conception is supported by the investigations carried out at the Dermatological Clinic of the Karolinska Institutet by C. Lennhoff, E. Hollström, and the present writer. A further question is, what type of infective agent should be suspected in the first place. Circular erythemas subsiding in the center and advancing peripherally with obviously local phenomena of allergization (and immunization?) as well as meningo-encephalitic processes occur not infrequently in association with diseases due to spirochetes or other infections, where the causal organism is present in *loco morbi* both in the skin and nervous system. Super- and re-infection are also not unknown in these conditions. Having regard to the points of view presented in the foregoing, it seems reasonable to raise the question of whether the ticks are carriers of spirochetes with allergizing (and immunizing?) properties.

The success of the drugs used in the present case as regards both eruption and meningitis, might then be explained by the fact that they were spirocheticides acting in *loco morbi* in the integument as well as nervous system. It still remains to prove the alleged pathogenetic significance of the spirochetoid bodies demonstrated by C. Lennhoff in specimens of the affected skin. Continued examination of material taken from the skin, spinal fluid, and regional lymph nodes might perhaps be expected to advance the study of pathogenesis.

SUMMARY

The etiology and pathogenesis of erythema chronicum migrans Afzelius with meningitis are discussed with reference to the writer's own cases and those recorded in the literature, attention also being paid to investigations carried out at the Dermatological Clinic of the Karolinska Institutet. Taking into account the sum of all this evidence, the present writer feels inclined towards interpreting erythema migrans, with or without meningitis, as due to an infective agent (a spirochete?) with allergizing (and immunizing?) behavior, the organism being transmitted by ticks and, possibly, other insects. Reasons are given for this conception.

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DISCUSSION (*Abstract*)

Dr. Samuel Goldblatt, Cincinnati, O.—It appears from this paper that Dr. Hellerström leans toward a bacterial or rather toward a spirochetal etiology for this disease, based upon the type of allergy produced, which resembles that of

syphilis, and the fact that one of the workers in his clinic has demonstrated spirochetal bodies in scrapings, and that penicillin rapidly reduces or obliterates the symptoms.

I should like to ask Dr. Hellerström whether Dr. Lennhoff has actually found living spirochetes in the lesions and, if that is so, why he has been unable to transmit the disease from a patient to a volunteer? It is perfectly comprehensible that he might not be able to transmit it to certain animals, since very few animals are susceptible to spirochetal diseases. It may also be necessary that certain previously allergizing phenomena have occurred in the volunteer before he can be infected with this particular agent, somewhat resembling the Army experience with Filaria bancrofti, where it was found that repeated mosquito bites were necessary before the filaria could be established as a disease of the patient. In this case, it may be necessary that the patient receive repeated tick bites before the phenomena of erythema migrans chronicum are demonstrable.

One of the most interesting manifestations is the type of lesion which keeps on progressing although no sizable body, such as we are used to consider in larva migrans, actually migrates through the skin.

Dr. Everett S. Lain, Oklahoma City, Okla.—I was impressed in Dr. Hellerström's discussion of symptoms and treatment, with the striking similarity of this disease to those of what we term rat bite fever in the South, of which I have seen a number of cases. Rat bite fever will also respond to arsphenamine and penicillin. I wonder whether he has had experience with rat bite fever.

Dr. Karl G. Zwick, Cincinnati, O.—Dr. Hellerström has contributed such a wealth of information about erythema chronicum migrans that his name should be linked up with that of Afzelius. Darier's "Erytheme papulo-circine migrateur et chronique et de quelques eruptions analogues" underwent similar enrichments resulting from subsequent investigations.

Dr. Hellerström (closing).—Our investigations tend to demonstrate that a spirochete is the cause of the disease. Definite evidence is still lacking, but Dr. C. Lennhoff's findings of spirochetes in histologic sections prepared from lesions of erythema migrans are remarkable. A few inoculation tests made up to now have given negative results. The material for inoculation has been taken from the circumference of the erythematous circles. The therapeutic results with penicillin and other antispirochetal drugs indicate that the spirochetes may be the causative organisms. As to the question, whether a patient after any bite of a tick regularly gets an erythematous eruption, I can say that this is not the case. We have the clear impression that it is just after a bite of certain ticks (reservoirs of ticks?) that the skin eruptions start.

The ticks I am speaking about live in Sweden in alder shrubs along the lakes or rivers. If a dog passes through those shrubs it is very easy later on, especially if he is long-haired, to catch the ticks on his skin.

It is interesting to hear from Dr. Lain that penicillin is effective in rat bite fever.

I myself am wondering whether we may be dealing with an organism like Proteus X 19. Proteus X 19, I believe, is also sensitive to penicillin and it may be suggested to make agglutination tests with the serum from the patients and Proteus X 19.

COLIC: ITS PATTERN IN INFANCY AND LATER LIFE*

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The thrill associated with the arrival of a new son or daughter knows no bounds. An atmosphere of great joy and expectation prevails. The fact that some infants develop great difficulties is never given a serious thought. However, if the new son or daughter becomes colicky, the parents learn from bitter experience the trials and tribulations associated with parenthood. No longer do happiness and ecstasy prevail. The parents become bewildered and turn to their pediatrician for help. Unfortunately at times his effort likewise proves fruitless. This is no reflection on the physician. It is due to the fact that colic, like teething, is only a symptom and, as such, has little or no mention during the excellent training a pediatrician receives these days. Nothing helps to deflate a pediatrician's ego more than a colicky baby who continues to suffer in spite of all scientific attempts to help him. Parents go the rounds for crying babies as much as for any disorder of early life.

Various lay articles and comics picture the poor father pacing the floor in his pajamas in despair. Folklore says certain babies are predisposed to colic for a period of three or six months.

Physicians who have been colicky babies themselves or had such in their immediate family realize the hopeless situation. They can sympathize with the parents. They feel the medical profession should pay more attention to colic from a preventive and therapeutic standpoint. An unmarried pediatrician, living alone, really knows little of the parents' plight and sometimes feels they are "making a mountain out of a mole hill."

Old folks feel it is possible to say who will be colicky. With this view in general I agree. From a careful perusal of the family past history this is often possible. An infant who has one or both parents who had colic in early infancy, or who now have clinical allergy, especially if it is the respiratory or digestive type, is an excellent candidate for allergy in its early form, namely, colic. Such a history requires more time than the far too conventional fifteen- or thrity-minute appointment.

While colic is the earliest recognizable allergic

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or allergic-like symptom of infancy, there is an even earlier one. That symptom is noted in prenatal life and is strongly substantiated by its subsequent course. I am speaking of fetal hiccoughs. It occurs in the latter half of pregnancy and could be made to recur at will in some twenty-five per cent of cases, as reported by me in a series in 1942.[1] At least fifty per cent of the fetuses who had hiccoughs *in utero* had colic later due to cows' milk sensitivity.

The word "colic" has different meanings for various people. Basically it refers to the infant who is frequently miserable and in much pain. During an attack he has a most anxious appearance, his abdomen is distended, his legs are flexed, and his hands wave about aimlessly. The extreme discomfort is due to stomach or intestinal distention from gas, or to pain from spasm of the muscles of those organs. Generally associated with colic are such signs and symptoms as nasal blockage or discharge, rattling sounds in the throat, excessive spitting up or vomiting, excessive hunger or anorexia, sleeplessness, mucus in stools, constipation or diarrhea, perianal irritation, papular rash on the face, nasal rubbing and so on. The colicky baby is always ready to eat, giving a false appearance of excessive hunger. When picked up, he continues to cry until his discomfort passes or until the heat of his mother's body relaxes stomach or intestinal muscles.

Colic may occur on either breast milk or cow's milk formulas. When a colicky baby is on breast milk, avoidance of some specific foods by the mother may alleviate the trouble. Careful questioning is needed to find the offending articles in the mother's diet. Mother's milk *per se* rarely causes colic or milk sensitivity. On the other hand, cows' milk is not an infrequent offender either from the lactalbumin or casein content.

Before attempting to solve the lactalbumin or casein sensitivity, where colic is concerned, certain factors must be eliminated. We must ascertain whether the formula is properly balanced, whether the calories are sufficient, whether the flow of milk is too slow or too rapid, whether improvement follows carbohydrate change, whether an atmosphere of calm prevails around the colicky infant, and so on. Attention to these factors may give some results. Of the sugars used in formulas, the one least apt to produce allergic symptoms is cane sugar.

Since few mothers can or will nurse their babies today, breast milk is not of much concern in colic. The big formula problem is with cows' milk in some form. The formula most generally given at first is evaporated milk. This is due to low cost, ease of preparation in making the formula, and to commercial propaganda. The boiling of milk fortunately denatures the lactalbumin, so whether or not the milk is boiled or evaporated or powdered, all of these processes denature the lactalbumin.

If denatured cows' milk is used for the baby with colic without success, our next step should be to try a modified milk which resembles chemically or physically mother's milk. "Similac" is a good milk to use here. Should the colicky symptoms persist, another formula, a low fat milk, might possibly be beneficial. The use of acidified milks is of little or no value, and later in life digestive disturbances prevail where those are used indefinitely.

Since all animal milks have a different lactalbumin, the next step for colicky infants is to try another animal's milk, namely, goat's milk. It can be used boiled, evaporated or powdered. At times, this change is all that is needed to overcome colic.

If after a few days the colic does not abate, then another form of protein is indicated. For this there is generally available at a reasonable price a vegetable milk, "mull-soy." This is the only form of vegetable protein that will sustain life indefinitely aided by vitamin C. Success with "mull-soy" eliminates lactalbumin and casein sensitivity. Casein sensitivity is denied by many, but if results are obtained here with a vegetable milk, it suggests previous casein sensitivity.

A failure with "mull-soy" and other animals' milk formulas suggests the use of a hydrolysate product, as nutramigen, for the essential amino acids. Although this is a horrible tasting formula, the very young infant, even though colicky, does not seem to mind it. As with "mull-soy," normal growth and happiness follow the use of these formulas.

At times none of the above mentioned formula routines agree and the unfortunate infant continues colicky. Here it is wise to alternate two or three formulas, continuing each until symptoms become noticeable, then quickly changing to another form, and vice versa.

In a few instances, health and freedom of symptoms follow the avoidance of all milk formulas and milk substitutes and the use of strained meats as beef, lamb or pork. In such instances we must also add some fat, as olive oil, and carbohydrate and calcium.

During the entire attempt to find the rule to fit the child, we can take advantage of antispasmodics such as atropin, of sedatives such as phenobarbitol, and of synthetic opium-like drugs such as demerol. The old-fashioned use of hot water bottles, warm water orally or as an enema, and whisky are still of value in attempting to amelioriate colicky symptoms.

Given a colicky baby or a baby with a family

background of allergy, we should do everything to avoid the possible tendency to allergic disorders. A simple plan to attempt to accomplish this is to avoid too early introduction of vitamins and foods, to avoid mixed or multiple vitamins or foods and to introduce single foods in a definite manner.

When introducing a new food or vitamin,[2] wait first five days then three days, before allowing its daily use. Should any untoward symptoms follow the first or second use, it should be avoided for a few months before reintroducing it again. Likewise a persistently disliked food had best be left off for a few months.

As a rule, infants who began with colic are found sensitive to many other foods, especially green vegetables. Throughout life they usually are poor vegetable eaters but are fond of most fruits. As a rule they are finicky eaters.

The colicky baby's symptoms persist until the optimum formula is found or for three to twelve months, when a temporary tolerance is established. After a short time it then may look as though the infant has possibly outgrown his potential allergy. This is not usually the case for around age two and a half or soon thereafter inhalant sensitivity begins to appear. Later, when kindergarten begins, the child who was previously a colicky infant will be found to miss much time from school during the school year. Such absence is due largely to recurrent or chronic head colds, sinus, croup, bronchitis or to digestive disturbances such as nausea, vomiting, abdominal pain or to headaches or fatigue. At school he is often a problem as he has difficulty keeping quiet and paying attention. He often molests other children.

It is often necessary to close windows at night and to keep colicky infants out of the wind as much as possible for the first few years of their lives.

If no attempt is made in early childhood to complete a comprehensive allergic study in order to correct the underlying allergy, the symptoms persist or become more intense. During the first year of life it is rarely necessary to resort to an allergic study if ample time is spent in questioning the mother concerning her colicky baby.

Many older children and adults who have at present a respiratory or digestive allergy, if closely questioned, will be found to have been colicky babies or difficult feeders in infancy. They still are found to be finicky eaters. This group will very frequently have a decrease in their allergic symptoms from the avoidance of milk. They either like milk a great deal or avoid it almost entirely.

Where there was persistent colic during the first year of life or various formula changes for many months, it is often wise to avoid milk as soon as the diet is sufficiently varied. This can be successfully tried at about ten or twelve months of age. By that time sufficient essential foods are consumed for satisfactory growth. Of course, calcium must be added to furnish that which is not obtained from milk. In a few months or years the child usually can go back on milk with no deleterious results, as he has built a tolerance to it.

Colic is a fairly frequent symptom in early infancy. It is a very troublesome complaint and often requires much attention on the part of parents and physician. Milk is often the offending substance. Success in treatment usually results more quickly if much time is spent in asking detailed questions of parents. It is usually far better to change the type of animal milk or milk substitute than to offer various types of cows' milk formulas. The slow introduction of single vitamins and foods is invaluable. A routine waiting period of first five, then three days, after the introduction of all new vitamins and foods gives us most useful knowledge. It is a great means of avoidance of future food sensitivity or at least ameliorating such sensitivity.

Colicky infants often develop into older children or adults with a respiratory or digestive type of allergy. This is similar to the eczema-asthma link. Comprehensive allergic care is necessary after infancy to overcome such disorders.

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OBSERVATIONS ON PREMATURE INFANTS FED MIXTURES OF COW'S MILK*

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In the recent past there has been a decrease in neonatal mortality rates. Prematurity still tops the list, however, as a cause of death in the pediatric age group, and the present premature mortality rate still constitutes a major challenge in the field of

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preventive medicine. The renewed interest shown by the American Academy of Pediatrics in neonatal mortality rates is but one expression of our inadequacy in this particular field of practice.

In 1936 one of us reviewed before this society the results with 432 premature infants admitted to the University of Virginia Hospital between the years of 1925-1935. We were prompted to make this report because of the departure from a supposedly fundamental rule in that the majority of these premature infants were artificially fed.

We have recently again taken stock of our progress in this particular phase of pediatric practice and it is the purpose of this discussion to describe our results with 484 consecutive premature infants admitted to the University of Virginia Hospital during the years of 1944-1948 and to compare where possible these two series. For the sake of convenience, we will throughout this discussion refer to the early series as Series I and to the more recent series as Series II.

In order that the two series can be properly evaluated, it may be helpful to review briefly the physical conditions in our nursery and facilities available for the care of premature infants as they pertain to Series I and Series II. All infants in both series were under the care of the Pediatric Department from the time they left the delivery room, and in both series we have included every infant admitted to our nursery breathing, regardless of size, estimated age, and length of life.

With Series I, facilities could hardly have been less adequate as compared with present-day standards. There were no special arrangements for those infants born prematurely. All infants in Series I spent their early days in a small wash room adjoining our full-term nursery. Here all full-term infants received their daily baths. We had no special equipment for the regulation of body temperature but depended solely on premature jackets, a common electric heater of the reflector type, hot water bags and blankets. To one graduate nurse trained for this purpose was entrusted the supervision of all newborn infants, and working under her direction was a constantly changing group of student nurses who of necessity did most of the actual nursing. There were no rigid rules of isolation. For teaching purposes all newborns, premature and full-term alike, were assigned to medical students under certain restrictions of nursery routine.

All infants included in Series II had the advantages of a separate nursery with reasonably rigid rules for isolation and a nursery technic which complied reasonably well with accepted standards. Adequate incubators were available. Nursery care was far better than that which prevailed for Series I but was still somewhat inadequate. Two hundred and seventy-two infants had the additional supposed advantage of air conditioning. Temperature conditions were constant although the relative humidity was considerably less than that generally considered optimum.

It is difficult to compare mortality rates of one series of premature infants with that of another series of equal size even when both series are one's own. An undue number of infants weighing less than 1,000 grams or in the low weight brackets can adversely affect mortality rates; so also will place of birth. Feeble premature infants born outside a hospital often do not live long enough to be hospitalized, while those surviving long enough to be hospitalized are apt to be fairly vigorous infants. In comparing a series of premature infants with any other series mortality rates are very misleading unless the number of infants in the various weight brackets are known. Our familiarity with Series I and Series II will, we believe, justify certain comparisons.

Table 1 shows the percentages of infants in the various weight brackets for Series I and Series II. In Series II there is a significant decrease in the number of infants in the 1,001-1,500 gm. bracket, otherwise the two series appear quite comparable.

Table 2 describes the mortality rates in the vari-

INCIDENCE BY BIRTH WEIGHT GROUPS

Birth Weight	Number		Per Cent	
	Series I	Series II	Series I	Series II
Total	432	484	100.0	100.0
1000 gm. or less	26	31	6.0	6.4
1001-1500 gm.	67	39	15.5	8.1
1501-2000 gm.	95	111	22.0	22.9
2001-2500 gm.	232	294	53.7	60.7
Birth weight unknown	12	9	2.8	1.9

Table 1

FATALITY RATE BY BIRTH WEIGHT GROUPS

Series		Fatality Rate (Per Cent)						
	2500 gm. or less	Total 2500 gm. or less	1000 gm. or less	1001-1500 gm.	1501-2000 gm.	2001-2500 gm.	Birth weight unknown
Series I	432	33.8	100.0	74.6	37.9	9.5	100.0
Series II	484	19.4	100.0	56.4	19.8	6.1	11.1

Table 2

ous weight brackets for Series I and Series II. A reduction in the over-all mortality rate from 33.8 per cent to 19.4 per cent seems well in line with recent reports from other clinics. Not only is there an encouraging reduction in the over-all mortality rate but also a substantial reduction of death rate in each bracket. Although our fatality rate of 19.4 per cent may compare favorably with other similar reports, the figure is still too high.

We are unable to report the survival of a single infant weighing less than 1,000 grams, although several have survived whose ultimate low weight approached the 1,000 gram figure.* *Table 3* gives the weights of those babies included in Series II weighing 1,000 grams or less.

Table 4 shows the corrected over-all mortality for Series I and Series II omitting those infants weighing 1,000 grams or less.

The first 24 hours of life exacted the usual high toll in both series. In Series I, 63 per cent of the total number of deaths occurred within the first 24 hours as compared with 51 per cent in Series II. It seems unlikely that any marked decrease in mortality rates for the first 24 hours of life will be accomplished by future changes in pediatric technic. These very early deaths constitute as a rule an obstetrical rather than a pediatric problem, and improvement in mortality rates for this group of infants will no doubt result largely from obstetrical advances.

INCIDENCE OF PREVIABLE INFANTS
Series II

Weight Group	Number	Per Cent
Total 1000 gm. or less	31	100.0
400-599 gm.	8	25.8
600-799 gm.	5	16.1
800-999 gm.	18	58.1

Table 3

CORRECTED FATALITY RATE OMITTING THOSE WEIGHING 1000 GM. OR LESS

Series	2500 gm. or less	1000 gm. or less	More than 1000 gm. Number	Died	Fatality rate (per cent)
Series I	432	26	406	120	29.5
Series II	484	31	453	63	13.9

Table 4

*Since these data were compiled we have graduated from our nursery an infant whose birth weight was 810 grams and whose ultimate low weight was 712 grams. This infant's nursery course was remarkably uneventful.

The corrected over-all mortality rate for Series I and Series II omitting all deaths occurring within 24 hours is shown in *Table 5*.

Table 6 describes the mortality rates in the various weight brackets for infants born inside and outside the hospital. The number of infants born outside is too small for statistical conclusions. The over-all mortality rate of 20 per cent for Series II as compared with 62.8 per cent for Series I is, however, encouraging. Premature infants born outside are arriving at the hospital much earlier and in far better condition. It is felt that this is a reflection of better maternal care and improved obstetrical technic. Infants in Series II born outside fared much better than those born inside the hospital.

Negro infants comprise 22.2 per cent of Series I as compared with 35.3 per cent for Series II. *Table 7* describes the mortality rates in the various weight brackets for Negro infants for Series II as compared with white infants. Similar figures were not available for Series I.

CORRECTED FATALITY RATE, OMITTING THOSE WHO DIED DURING FIRST 24 HOURS

Series	2500 gm. or less	First 24 hours	Survived first 24 hours Number	Died after first 24 hours	Fatality rate (per cent)
Series I	432	92	340	54	15.9
Series II	484	48	436	46	10.5

Table 5

DEATHS AND FATALITY RATES ACCORDING TO PLACE OF BIRTH BY BIRTH WEIGHT GROUPS

Birth weight	Born In This Hospital: Live-born Number Series I	Live-born Number Series II	Deaths Number Series I	Deaths Number Series II	Fatality rate Per cent Series I	Fatality rate Per cent Series II
Total 2500 gm. or less	397	434	124	84	31.2	19.3
1000 gm. or less	24	28	24	28	100.0	100.0
1001-1500 gm.	47	28	36	20	76.6	71.4
1501-2000 gm.	86	94	31	19	36.0	20.2
2001-2500 gm.	229	284	22	17	9.6	5.9
Birth weight unknown	11	0	11	0	100.0	0

Birth weight	Admitted After Birth: Number Series I	Number Series II	Number Series I	Number Series II	Per cent Series I	Per cent Series II
Total 2500 gm. or less	35	50	22	10	62.8	20.0
1000 gm. or less	2	3	2	3	100.0	100.0
1001-1500 gm.	20	11	14	2	70.0	18.2
1501-2000 gm.	9	17	5	3	55.5	17.6
2001-2500 gm.	3	10	0	1	0	10.0
Birth weight unknown	1	9	1	1	100.0	11.1

Table 6

The mortality rates for Negro infants in the 1,501-2,000 gram and the 2,001-2,500 gram bracket were better than those of the white infants in the same brackets. It is a well-established fact, however, that Negro infants are smaller than white infants. It is quite likely, therefore, that the Negro infants in the above brackets were actually born closer to term than the corresponding white infants. Actually, the over-all mortality rate as shown in *Table 8* for Negro infants was quite similar for Series I and Series II as compared with white infants of the same series.

In Series II, 212 infants resided in our premature nursery before air conditioning was installed. The over-all mortality rate for this group was 20.3 per cent. The remaining 272 infants resided in an air-conditioned environment. The mortality rate of this group was 18.8 per cent. The value of an air-conditioned nursery is not reflected by any noteworthy improvement in over-all mortality rate. In fairness to air conditioning, it should be stated that optimum relative humidity was not available with our equipment. Temperature conditions on the other hand were remarkably constant. It is our impression that minor illnesses were less frequent following air conditioning.

If the incidence of premature births is to be materially lowered, it must of necessity be by detection and prevention of abnormalities and illness on the part of the mother. *Table 9* describes the percentage incidence of various factors that may have influenced prematurity in Series I and Series II.

Table 10 describes the fatality rate for Series I and Series II according to type of delivery. The fatality rate associated with cesarean section appears unusually high for both series.

DEATHS AND FATALITY RATES ACCORDING TO RACE BY BIRTH WEIGHT GROUPS
Series II

Birth weight	Born In This Hospital: Live-born			Deaths			Fatality rate		
	Total Number	Number White	Number Colored	Total Number	Number White	Number Colored	Total Per cent	Per cent White	Per cent Colored
Total 2500 gm. or less	434	280	154	84	55	29	19.3	19.6	18.8
1000 gm. or less	28	13	15	28	13	15	100.0	100.0	100.0
1001-1500 gm.	28	22	6	20	15	5	71.4	68.2	83.3
1501-2000 gm.	94	59	35	19	14	5	20.2	23.8	14.3
2001-2500 gm.	284	185	98	17	13	4	5.9	6.9	4.1
Birth weight unknown	0	0	0	0	0	0	0	0	0
Admitted After Birth									
Total 2500 gm. or less	50	33	17	10	5	5	20.0	15.1	29.4
1000 gm. or less	3	1	2	3	1	2	100.0	100.0	100.0
1001-1500 gm.	11	7	4	2	0	2	18.2	0	50.0
1501-2000 gm.	17	10	7	3	2	1	17.6	20.0	14.3
2001-2500 gm.	10	9	1	1	1	0	10.0	11.1	0
Birth weight unknown	9	6	3	1	1	0	11.1	16.7	0

Table 7

FATALITY RATE ACCORDING TO RACE

Series	2500 gm. or less: White	Colored	Died: White	Colored	Fatality rate (per cent): White	Colored
Series I	336	96	116	30	34.5	31.2
Series II	313	171	60	34	19.1	19.8

Table 8

PERCENTAGE INCIDENCE OF VARIOUS FACTORS THAT MAY INFLUENCE PREMATURITY

Conditions associated with premature birth	Series I	Series II
No cause suggested	37.7	49.3
Multiple births	18.1	15.7
Toxemia	22.9	11.9
Bleeding:		
Placenta previa	4.3	2.1
Premature separation of placenta	2.8	3.0
Unstated cause	1.3	2.3
Premature rupture of membranes	1.5	5.8
Syphilis	1.0	0.7
Serious illness of mother:		
Heart disease	0.5	1.6
Tuberculosis	0.3	0.7
Other acute and chronic conditions	5.5	4.6
Abnormalities of genital tract:		
Pelvic deformities	1.0	0.2
Myoma	0.5	0.5
Hydramnios	0.3	0.2
Trauma to mother	1.0	0
Other conditions	1.3	1.4

Table 9

FATALITY RATE ACCORDING TO TYPE OF DELIVERY

Type of delivery	Fatality rate (per cent) Series I	Series II
Spontaneous	30.2	19.1
Operative	32.9	20.2
Cesarean	50.0	40.0
Breech extraction	31.6	20.0
Forceps	11.1	9.1
Version and extraction	50.0	18.7
Voorhees bag	33.3	—
Locked twins	100.0	—

Table 10

Table 11 describes the fatality rate in the various weight brackets for Series II according to type of delivery. Similar data were not available for Series I. In *Table 11* the zeros indicate no fatalities, and the dashes indicate no infants in that particular group. Fatality rates in Series II in relation to operative deliveries appear to have been considerably improved.

It is often difficult to determine the causes of death in a premature infant by clinical impressions alone. Even at autopsy and with the aid of an experienced pathologist, cause of death is often not apparent. In Series II postmortem examinations were permitted in 46 instances (48.9 per cent) and in Series I in 42 instances (28.7 per cent). A simple classification of the probable causes of death is shown in *Table 12*. Anoxia is not given a separate classification and instances of aspiration pneumonia are included under infections.

FEEDING

In 1936 when we described our experience with lactic acid milk as a suitable food for premature infants, even for those in the lower weight brackets, it was admittedly a departure from one of the supposedly fundamental rules of premature care. In recent years evidence has been fast accumulating which suggest that human milk is not the food of choice for premature infants. It is without any hesitancy that we describe at this time our results in a series of premature infants fed with mixtures of cow's milk. At the present time it is reasonable to assume that the majority of premature infants receive some type of artificial feeding.

We have had experience with various formulas and have found none preferable to lactic acid milk. Acid milk can be safely fed infants in the low weight brackets with a minimum of symptoms referable to the gastro-intestinal tract. We know of no formula with cow's milk as its main constituent that is better tolerated. It can be fed safely to the average premature in the low weight brackets without dilution with water, thus affording a maximum caloric intake in a concentrated form. It has been our further experience that acid milk prepared according to Marriott's original formula is preferable to that prepared from evaporated milk, in that the fat content can be readily altered when this seems advisable. Our preference for acid milk is the result of a familiarity with this type of feeding which began twenty-four years ago. It is routine in our premature nursery that all premature infants in the low weight brackets receive acid milk. Shortly before graduation from the nursery they are placed on a suitable evaporated milk mixture. Larger and borderline prematures are started on an evaporated milk mixture as their first feeding. All infants receive suitable vitamin supplements.

Table 13 indicates the types of feeding employed in infants who survived for both Series I and Series II. Zeros indicate no infants in a particular category and dashes indicate no percentages. The greatly increased number of infants in Series II fed acid milk is apparent. Only one infant in Series II received human milk alone. Twenty-five received

FATALITY RATE ACCORDING TO TYPE OF DELIVERY BY BIRTH WEIGHT GROUPS
Series II

Type of delivery	Total 2500 gm. or less	1000 gm. or less	1001-1500 gm.	1501-2000 gm.	2001-2500 gm.
Spontaneous	19.1	100.0	74.1	16.4	5.0
Operative	20.2	100.0	0	33.3	9.1
Cesarean	40.0	—	0	66.7	30.8
Breech extraction	20.0	100.0	—	20.0	0
Forceps	9.1	100.0	—	14.3	4.0
Version and extraction	18.7	100.0	—	33.3	8.3

0 = no fatalities. — = no infants in that group.

Table 11

CAUSES OF DEATH AS DETERMINED BY POSTMORTEM EXAMINATION

Cause of death	Number Series I	Number Series II	Per cent Series I	Per cent Series II
Total	42	46	100.0	100.0
Prematurity alone	24	14	57.1	30.4
Infection	8	9	19.1	19.6
Hemorrhage	9	17	21.4	37.0
Congenital Defect	0	3	—	6.5
Other	1	3	2.4	6.5

Table 12

MAJOR FEEDING OF THOSE WHO SURVIVED

Major feeding	Number Series I	Number Series II	Per cent Series I	Per cent Series II
Total	286	390	100.0	100.0
Lactic acid milk	90	298	31.5	76.4
Evaporated milk	0	53	—	13.6
Whole boiled milk	6	0	2.1	—
Breast milk	11	1	3.8	0.3
Breast milk plus lactic acid milk	179	25	62.6	6.4
Breast milk plus evaporated milk	0	13	—	3.3

Table 13

both breast and acid milk and it is safe to say that the amount of human milk was insignificant.

Table 14 concerns Series II only and depicts types of feeding in the various weight brackets for those infants who survived. It is apparent that practically all of the surviving smaller infants were fed acid milk.

COMMENT

From these data it seems reasonable to conclude that premature infants in the University of Virginia Hospital have a 31 per cent better chance of survival than they had some fifteen to twenty years ago. Advances in both obstetric and pediatric technics and standards have contributed to these improved fatality rates.

It is somewhat difficult to say which improvements in pediatric technic have contributed most to an improved fatality rate. Perhaps they might be listed as follows:

(1) A separate premature nursery with reasonable rules of isolation, with more emphasis placed upon prevention of infections;

(2) A more specialized type of nursing;

(3) A better understanding of acid-base balance and the more judicious use of parenteral fluids and blood transfusions;

(4) The advent of the sulfonamides and antibiotics.

The fact that the over-all mortality rates as reported from those clinics with reasonably similar facilities are quite comparable, suggests that we may have arrived at somewhat of a stalemate in our efforts to lower the death rate of premature infants in so far as pediatric technics are concerned.

It seems reasonable to believe that the interest shown by the American Academy of Pediatrics and the effort to stimulate interest at the state and local levels may necessitate improved facilities in those institutions in which facilities are inadequate. It is safe to say, however, that unless improved physical conditions and suitable standards are accompanied by a more specialized type of nursing and a premature-minded attending staff, maximal results can hardly be expected. It is to be hoped that this renewed interest will result in an improved mortality rate for the country as a whole.

It seems doubtful that new pediatric procedures will materially lower mortality rates in those institutions which now have presently accepted facilities and standards. It seems likely that major advances will be in the field of obstetrics. Until a way can be found to carry more of those premature infants closer to term with safety to the mother and with fewer infants dying within the first twenty-four hours of life as the result of anoxia and birth trauma, the premature fatality rate will doubtless remain discouragingly high. Also to be remembered are those infants born with congenital anomalies of such nature as to be incompatible with survival.

MAJOR FEEDING OF THOSE WHO SURVIVED ACCORDING TO PERCENTAGE BY BIRTH WEIGHT GROUPS
Series II

Major feeding	Total 2500 gm. or less	1000 gm. or less	1001-1500 gm.	1501-2000 gm.	2001-2500 gm.
Total	100.0	—	4.1	23.6	72.3
Lactic acid milk	76.4	—	4.1	22.3	50.0
Evaporated milk	13.6	—	—	—	13.6
Breast milk	0.3	—	—	—	0.3
Breast milk plus lactic acid milk	6.4	—	—	1.3	5.1
Breast milk plus evaporated milk	3.3	—	—	—	3.3

Table 14

DISCUSSION (*Abstract*)

Dr. Lee E. Sutton, Richmond, Va.—At present there is much interest being shown about the premature. Statistics show that prematurity is the number one killer among the causes of death reported for infant mortality. Prematurity is responsible for slightly less than 50 per cent of the deaths in infants recorded in the first month of life. It is very important that we learn more about it.

Dr. Waddell's results were gratifying in that the over-all mortality rate of the first group 33.8 per cent was reduced to 19.4 per cent in the second group a lowering of 42 per cent. If in the next 10 years he can do as well, it will certainly be an attainment. Much help in improving facilities for the premature can be obtained from the report of the American Academy of Pediatrics Committee on Fetus and Newborn.

Infant mortality for the Southern states shows the mortality among the Negro infant to be greater than that of the white, about 2 to 3.

Dr. Katherine Bain *et alii* in a report submitted to the journal, Pediatrics, in the October issue of this year shows that the fatality rate among premature infants by race, 49 hospitals over the United States reporting, was for whites 24.5, and for non-whites 27.7.

Dr. Waddell shows that this does not hold true at his clinic. For the premature born in his hospital the mortality for the white was 19.6 per cent and for the non-white 18.6 per cent. If the Negro premature infant is given the same advantages after birth it seems to survive as well. This can be partially explained by the fact that the average Negro premature is older according to the period of gestation, yet there is more congenital syphilis present in this group and the chances are that the mothers have not had such good prenatal advantages.

Our essayist has expressed his preference for lactic acid milk feeding. Other pediatrists as you know are as enthusiastic about "alacta," "olac" or other milk combinations. All appear to obtain good results. It is certainly evident that a pediatric staff interested in prematures, well versed in the principals of infant feeding, will get good results with its own type of feeding.

One condition that should be stressed regarding premature success is the part played by the nurse in charge of the premature nursery, who is responsible for getting the food into the prematures. Many a death has been saved by the acuity of a capable and well-trained nurse. If I am allowed to express my own opinion I would say that she is the most important cog in the wheel of activities for the successful care of the premature.

A REVIEW OF SEPTAL SURGERY*

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and
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The first operation for deformities of the septum was undoubtedly the removal of the entire septum. Early observers believed that the septum itself served little function so far as support of the external nose and the physiology of respiration were concerned. Until the time of the first submucous operation, which was about 1890, many operations were designed to save all structures making up the septum and at the same time to correct obstructions. Most of these procedures were ineffective and, in some instances, dangerous. We shall describe briefly several of the better known operations.

Sluder designed an operation for marked angular deviations. This operation consisted of three parallel incisions through the mucous membrane and cartilage on the same side as the convexity. The first incision was above the ridge, the middle one through or along the ridge, and the lower incision below the ridge. The deviated cartilage was pushed over so that the upper piece overrode the lower and was held in place by a hollow splint or Bernay splint until union took place in the corrected position.

Gleason described an operation which was used frequently in treating children in whom the cartilage was bent in a cup-like manner with a marked concavity on one side and a convexity opposite. It consisted of a U-shaped incision through the entire thickness of the cartilaginous septum. A saw was inserted below the deflection in the convex side making a U-shaped flap. The flap was then forced far into the concave side to break the attachment above. A nasal tube was inserted to give support. Watson described an operation similar to Gleason's, but it was designed for dislocations of the septal cartilage from its articulation with the intermaxillary suture. The incision was bevelled and was made from the concave side through the convex side and the septum was pushed over to the concave side so that the edges were back to back and were held in place by a splint.

The Asch operation was very popular before the advent of the submucous operation. Asch designed a cutting forceps which straddled the septum making crucial incisions, thus literally cutting the septum through its entire thickness into pieces at the site of the convexity. An attempt to overcome the resiliency of the cartilage was made by forcing the pieces with a finger or rigid instrument into the concave side. The displaced cartilage was held in place by perforated hard rubber tubes or splints. They were removed and cleansed from time to time and kept in place for several weeks.

Roe designed an operation similar to that of Asch but used gauze packs instead of splints. These operations were generally unsatisfactory because almost invariably the cartilaginous and bony structures failed to remain in the midline position and returned to the original position of the deformity, thus failing to relieve the obstruction.

The failure of these principles in correcting obstructions of the septum led to the development of the modern submucous operation. This procedure, although frequently called the Killian operation, should not be credited to any one individual but to a number of prominent rhinologists such as Freer, Killian, Hajeck, Yankhauer, and Ballinger. Each one contributed some development to the technic to meet obstacles that arose in the various steps of the procedure. The indications and the technic of the present-day operation are so well known that it is not necessary to discuss them.

We should like, however, to enumerate a number of points which we feel contribute to a successful submucous operation:

(1) An adequate straight incision should be carried well down on the floor of the nose anterior to the deformity, usually on the convex side, if possible.

(2) Sharp dissection with a knife may be neces-

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sary at the junction of the perichondrium and periosteum to avoid the tearing of the flaps.

(3) The use of fluid injected beneath the mucosa will facilitate elevation over angular or sharp spurs.

(4) It may be necessary to leave a small area of mucoperiosteum or mucoperichondrium attached to a spur until the spur has been removed by a chisel; most of these attachments are cartilaginous and they can then be separated from the membrane by sharp dissection. The use of a strabismus hook around an angular spur may facilitate elevation.

(5) The elevation of the mucoperichondrium and mucoperiosteum should be as complete as possible before removing any part of the septum.

(6) Correct only the deformity; leave as much of the framework of the septum as possible.

(7) Repair or correct perforations at the time of the operation.

(8) When possible replace cartilage between the flaps to reduce the flaccidity of the membrane.

(9) Attention should be paid to drainage and packing to insure against postoperative hematomas.

The Killian operation is fairly satisfactory for the posterior (cephalic) compartment of the septum involving the bony framework, but there are many objections to it concerning correction of the cartilaginous (or caudal) compartment. Some of the objections to the so-called Killian operation are as follows: (1) It is not always adaptable in children. (2) The removal of the most ventral portion of the cartilaginous part of the septum with high deflection and the most caudal portion with anterior dislocation is not attempted because of the danger of resulting contraction causing saddling of the dorsum of the nose and distortion of the tip. Consequently, these deformities are not corrected, and the function is not restored as far as the pathways of the normal air currents are concerned. (3) The removal of most of the cartilaginous and bony framework of the septum causes a resulting flaccidity. The membrane is unable to resist intranasal pressures and as a result there is a distortion of the normal pathways of air currents. (4) In cases of twisted nose with deformity of the vertical buttress, if the buttress is not removed, the obstruction still remains. (5) Occasionally in the removal of the cartilage there may be lacerations of the membrane with resulting perforation.

As we have said previously, the Killian submucous operation is fairly satisfactory for deformities of the posterior or bony compartment, but is not adequate for dislocations and deformities of the anterior or cartilaginous compartment. If the anterior cartilage is removed, which often is necessary to relieve the obstruction, a dropped tip, retracted columella, or a saddling may result. Procedures have been attempted to overcome these complications. Metzenbaum suggested a method for correcting anterior dislocations of the cartilaginous septum. He advocated in principle making an incision over the caudal end of the septum and elevating the mucous membrane on the opposite side. He then incised through just the cartilage posteriorly, freeing the caudal end from the soft tissues of the columella. An incision was also made only through the cartilage at the base. The only remaining attachment was above. Cross hatching of the deformed cartilage was sometimes necessary. Following this, the cartilage was placed in a groove made in the vomer and sutured in place into a new pocket in the columella. This operation was fairly successful, but in some instances the cartilage returned to the previous position.

The principle of removing the cartilage of the septum and replacing it between the mucous membrane flaps is not new. The cartilage of the septum is nourished by lymph through inhibition. Fomon and his associates have devised several technics to correct deformities of the cartilaginous part of the septum, attempting to overcome the faults of the Killian operation which were outlined previously.

During the last few years several operations have been suggested by Fomon and his associates for the correction of dislocations of the anterior or cartilaginous compartment of the septum. The principle of these operations was based on the fact that the deformed cartilaginous septum could be removed and that portion which was straight re-inserted between the mucosal flaps and held in a pocket made in the columella. At first it was the opinion of some operators that the septum did not contribute to the support of the nose except during periods of stress and strain and that the entire septum could be removed without immediate saddling. This did not prove to be true in a number of our cases. Fomon has pointed out that there is a weak area on the dorsum between the upper and lower lateral cartilages where the saddling may occur in certain cases. We substantiated this in the laboratory. A number of dissections revealed that there was considerable variation in the upper lateral cartilages and there was a fairly large area between these cartilages which required the septal cartilage as support to prevent saddling. In the majority of cases, except in a so-called twisted nose with resulting

deformities of the upper lateral cartilages, all of the septum need not be removed and a portion of the cartilage along the dorsum should be left in place.

The first operation suggested by Fomon consisted simply of removing the septal cartilage in one piece and replacing it between the septal flaps; the cartilage was then drawn into a bed or pocket made in the columella. This operation was fairly successful but had certain objections, namely: (1) the nose had a frozen and stiff appearance; (2) when the cartilage was in one large piece there was often buckling during healing due to the lines of force of contraction which converged toward the center of the healing area.

The next procedure consisted of removing the cartilage, placing a batten in a previously made columellar pocket and then, after packing the nose, inserting small pieces of cartilage between the flaps. The packs made it possible to hold the pieces in the desired positions between the flaps. This operation was more successful because the buckling did not occur; with the smaller pieces the lines of force were broken up. The pocket for the batten was not made so far caudally and the frozen, stiff appearance of the nose was obviated.

The latest procedure which has given us the best results is similar to the one described above except that we have been suturing the small pieces together with fine catgut sutures thus helping to keep the pieces in position, the small spaces between the pieces being sufficient to break the so-called lines of force and eliminate the buckling.

The Technic of Septal Reconstruction.—A point worth emphasizing is that strict aspectic technic, insofar as is possible about the face, is necessary before and during a septal reconstruction. Before the patient is taken to the operating room the vibrissae are clipped from the nasal vestibules which are then thoroughly washed with soap, alcohol, and ether. Intranasal analgesia is accomplished by blocking the internal nasal nerves, the sphenopalatine ganglia, and the region of incisive canals. We have found a half-and-half mixture of 10 per cent cocaine and 1:1,000 epinephrine to be adequate.

After the patient is placed on the operating table his face is scrubbed with soap, alcohol, and ether and the nasal vestibules are again washed with the same agents. The patient is draped from head to foot so that only the nose presents in the operative field.

In order to obtain more adequate analgesia and to provide some measure of hemostasis the membranous septum is injected with 1 per cent procaine containing 1:30,000 epinephrine.

The analgesia described is entirely adequate for doing any type of septal surgery. If the surgeon desires to incorporate procedures on the external nasal pyramid at the same time, as is often the case, it is necessary to inject procaine and epinephrine solution about the infratrochlear, external nasal, and infra-orbital nerves.

The type of incision to be made through the septal mucoperichondrium will depend upon the septal deformity and the inclination of the surgeon. Some prefer a high unilateral incision on only one side of the septal cartilage, an incision almost identical with that of Killian or Freer, while others elect to transect completely the membranous septum. We believe that the latter incision will afford more adequate exposure in most cases.

After the septal mucosa is incised the surgeon proceeds to elevate the septal flaps by any method to which he is accustomed, and the elevation is carried as far as is necessary to expose all septal obstructions. The obstructing septal skeleton (both cartilaginous and bony) is removed with swivel knife, biting forceps, and chisel.

In order to prevent retraction of the columella and drooping of the nasal tip during subsequent healing it is necessary to place cartilage in the former. A pocket is prepared in the columella by passing a scalpel or pair of small scissors through the septal incision and separating the two leaves of the columella. From the removed septal cartilage a strip is cut so that it is about 0.5 to 1 cm. in width and is about as long as the distance from the tip of the nose to the septolabial angle. This strip of cartilage is placed in the previously prepared columellar pocket and fixed in place by two through-and-through mattress sutures passed just cephalad to it.

The replacing of cartilage between the septal flaps is necessary to prevent flaccidity of the septum and in certain instances to prevent saddling of the nasal dorsum caused by scar contraction between the flaps during healing. We replace the septal cartilage in small rectangular pieces (about 0.5 by 1 cm.) and have found that suturing the pieces edge to edge with No. 5-0 plain catgut greatly facilitates their handling. The sutured cartilage is placed between the septal flaps and the flaps are applied to it by firm packing of the nasal cavities with one-inch gauze impregnated with petrolatum. The septal incision is closed with interrupted sutures of No. 4-0 silk.

If the septal cartilage is replaced in the described manner the membranous septum will remain mobile so that a frozen appearance about the nasal lobule is avoided and there will be no tendency toward a buckling of the septum during healing. If unequal scarring between the two septal flaps takes place there will be enough shifting between the fragments of replaced cartilage to compensate for it and allow the septum to remain in the midline.

We have used both autogenous and homologous cartilage. The autogenous cartilage should be used whenever possible as it is less likely to be absorbed. Homologous cartilage tends to be absorbed but apparently remains long enough to prevent contraction.

COMMENT

The progress of septal surgery may be divided into two phases. The first consisted of removal of the obstructing septum; the second consists of reconstructing the septal skeleton in the midsagittal plane in an attempt to restore more nearly normal nasal physiologic activity. We believe that the second phase is in its early stages of development, and that a great deal of further research and operative experience will be necessary before the procedures can be perfected and standardized.

DISCUSSION (*Abstract*)

Question.—Does the cartilage graft prevent perforation?

Dr. Lierle.—If you have tears of the soft tissue flaps which are opposite each other after removal of the cartilage, this would undoubtedly result in a perforation if left alone. One may insert a piece of cartilage and suture it in place and thus prevent a perforation.

Dr. Henry M. Goodyear, Cincinnati, O.—I would like to ask Dr. Lierle if he sutured any of the pieces of cartilage that he puts in the middle part of the septum. Apparently from the picture presented he makes no attempt at suturing.

Dr. Lierle.—One can keep the small pieces of cartilage in place without suturing them between the septal flaps by first packing each side of the nose rather firmly with vaseline gauze strips and then inserting the pieces of cartilage. The packs will keep them in place. The larger pieces may be sutured in place but we prefer not to suture the smaller pieces.

Question.—How early may one do a reconstruction of the septum?

Dr. Lierle.—We prefer to wait until the child is at least five years of age.

Question.—How do you remove deformities of the vomer? Do you use chisel and hammer?

Dr. Lierle.—We are very careful to have complete elevation before removing any part of the vomer with the chisel.

Question.—I should like to ask Dr. Lierle if he has any unfavorable results in the use of 10 per cent cocaine for anesthesia. We inject procaine between the mucous membranes.

Dr. Lierle.—We use a solution of equal parts of 10 per cent cocaine and 1-1,000 epinephrine so that we are really using only a 5 per cent cocaine. We have had no difficulty up to the present time. We inject a solution of 1.5 per cent "monocaine" with epinephrine (1-30,000) which helps when elevating the mucoperichondrium and periosteum. Certain individuals feel that the higher percentages of cocaine are preferable due to the fact that it causes immediate constriction of the blood vessels and therefore lessens the absorption. We, of course, always use barbiturates when using cocaine.

THE EVALUATION OF PROCEDURES AND FINDINGS IN PROCTOLOGIC EXAMINATIONS*

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The procedures and findings in a proctologic examination are as much or more conclusive than in any other specialty, but there are fewer proctologic examinations made and of this number, probably more are incomplete than in any other specialty.

The first essential in a proctologic examination is for the physician to remember that "next to the eye, the anus and lower part of the rectum are the most sensitive areas in the body." Therefore, gentleness of touch and manipulation should be followed in whatever procedure or method is to be used. If the doctor has any hypnotic virtues, this is the time they should be used to their fullest extent. Often the use of well-controlled suggestions will make the difference between a successful or an unsuccessful examination.

History.—As in other specialties, the first procedure should be a well-taken history with careful evaluation of each statement made by the patient. When possible, the patient should be in a good light and seated so that you may look him straight in the eye during the interrogation. Questions should be asked with such tact and diplomacy as quickly to establish confidence, relieve embarrassment, allay fear, and place the patient at ease with the physician. The value of the history depends upon the

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completeness of information obtained. The history should begin with the present illness, because the patient is usually most concerned with the current symptoms. Emphasis should be placed upon the nature, duration and severity of the condition. Even though carefully taken, the history may sometimes be misleading, for example:

The parents of a child age 5 said that the child had dysentery with no control of his bowels and had been treated with that diagnosis for four months. Careful questioning brought out the facts that there was staining and soiling of the clothing and of the anal parts with soft pasty bowel contents as much as four to six times daily, but there was no liquid passage of bowel contents. The child was well developed and did not know when the passage occurred. Digital examination revealed a paste-like fecal impaction which filled the rectum and most of the sigmoid colon, with seepage of mucous and bowel contents around the impaction.

Posture in Examination.—The posture of the patient during examination is important. The patient should be as comfortable as possible, permit muscular relaxation, give good exposure of the parts in question and permit free and gentle manipulation by the examining physician.

A right or left prone posture with the feet together, the knees and thighs flexed at about 45° angle, the arm next to the table placed behind the patient, is comfortable for the patient and tends toward muscular relaxation. This position permits gentle manipulation, gives good observation of the anorectal region, allows palpation of inguinal and abdominal regions, digital, bidigital rectal or bidigital rectovaginal examinations, anoscopy and proctoscopy. This posture, as a rule, is not suitable for sigmoidoscopy. A change to an inverted position increases the ease of examination and makes possible complete proctosigmoidoscopic visualization. If an examining table is not available, the knee-chest position may be used. The bending over an examining table or the back of a chair may be a satisfactory posture in a prostatic examination, but it has little to be recommended in proctology.

Lubricants.—The use of a bland nonirritating good lubricant aids much in the ease of examination and prevents or decreases pain to the patient. Lubricants that cause stinging burning sensations when applied to a raw or irritated surface stimulate sphincter contractions which decrease the cooperation of the patient and make examination more difficult.

Disease of the anus, rectum and colon, as in other parts of the body, manifests itself by abnormal sensations and events and changes in appearance, structures or functions. The abnormal sensations and events are subjective symptoms, described by the patient, and can be obtained and evaluated only by a careful history. The changes in appearance, structures or functions are objective signs, determined through the following procedures: inspection, palpation, digital, bidigital rectal, bidigital rectovaginal examinations, anoscopy, proctosigmoidoscopy, biopsy, radiography and laboratory studies in the order mentioned, and not in the too frequent order of doing the x-ray examination immediately after taking the history.

Inspection.—A careful inspection of the anorectal region will reveal deformities, soiling or lack of cleanliness of the parts, excessive growth of hair, nutrition of cutaneous structures, flabbiness of muscles, relaxed or spastic sphincters, moisture, discoloration, excoriations, cracks, fissures, discharge, ulceration, swellings, protrusion, external openings, new growths, pin worms, lice, nits, and so on.

Palpation.—Gentle palpation of the local parts will reveal increase or decrease in local temperature, swelling, induration, extent of lesion, whether soft, hard, smooth, or nodular. Increase in local temperature with swelling, redness and discoloration is suggestive of an inflammatory condition, usually due to staphylococcic, streptococcic, or colon bacillus infection. Discoloration, induration and ulceration without increase in local temperature is suggestive of a noninflammatory condition or a tuberculous lesion.

A single protrusion that appears suddenly at the anal margin or just within the grasp of the external sphincter, that is smooth, firm, and often blue in color, gives continuous pain, is covered by cutaneous tissue, and is not reducible into the rectum, is usually an acute thrombosed external hemorrhoid and belongs outside.

Digital Rectal Examination.—Digital rectal examination reveals muscular contraction or relaxation, size of anal outlet, areas of tenderness, indurations, ulcerations, fecal impactions, foreign bodies, constrictions, swellings or deformities, obstruction, tumors, fixation to surrounding tissue and other abnormalities. A well-fitted lubricated cotted finger and gentle palpation and manipulation are essential for a satisfactory examination and evaluation of findings.

Bidigital Rectal Examination.—Bidigital rectal examination, with the forefinger in the rectum, and the thumb on the cutaneous structures aids much in diagnosing lesions of the coccyx and surrounding structures.

Bidigital Rectovaginal Examination. — Bidigital

rectovaginal examination, one finger in the rectum and the other in the vagina, aids much in determining and evaluating rectoceles, deformities, fistula, new growths, and other lesions in the rectovaginal septum.

Biopsy.—A piece of tissue sufficient in size should be removed from the most suspicious part of the lesion for pathologic examination. Repeated biopsies of doubtful lesions are to be recommended depending upon the clinical changes in the lesion. Where bleeding is free, desiccation of the excised area may be necessary to control hemorrhage from the biopsy lesion.

X-ray.—X-ray examinations are invaluable in the study of diseases of the sigmoid and colon and should be used freely. In doubtful findings with persistent clinical manifestations, the examinations should be repeated at varying intervals. X-ray examinations are of little value in the study of early lesions or diseases of the anus and rectum. It is hard for me to see why a physician would order an x-ray study on a part that can be easily seen and felt and in which the findings are definite. Negative findings in x-ray examinations of the anus and rectum probably cause more errors in diagnosis than x-rays of any other part. Small lesions of the anus and rectum do not show on x-ray examinations and even large lesions often give negative findings. A negative report may give a sense of false security both to the doctor and the patient and may cause delay until a simple lesion becomes an incurable condition or a prolonged discomfort to the patient. Probably a good dictum is to use x-ray freely in suspected lesions of the colon, but never to use or depend upon it alone in suspected lesions of the anus and rectum.

Amebiasis.—The diagnosis of amebiasis depends upon the finding of the Endamoeba histolytica by means of the microscope. The finding of the motile ameba and ulceration of the rectum and colon, is a definite pathologic condition and should be treated as such until repeated findings are negative. The incidental finding of the encysted forms on stained smears without any clinical manifestations or proctologic signs, in my opinion, should be evaluated as a laboratory finding and not as a diseased condition. Further re-check for the motile organisms should be made, if clinical manifestations and proctologic signs occur. The finding of the ameba is greatly increased by obtaining smears directly from the lesions through the sigmoidoscope, placing them on a warm slide and examining them immediately, or from a warm liquid stool following a saline laxative.

Negative findings may have a significant value in determining certain conditions: for example in "cramp in the rectum," or "coxalgia fujax." Negative findings plus a well-defined descriptive history of the characteristic "attacks of pain" described by the patient, give a definite clue in determining this condition.

Claims that cannot easily be substantiated by other workers, as a rule, are of little value and are often misleading and may be hard to erase, for example: the claim of Bargen for "Bargen's bacillus," as the cause of non-specific ulcerative colitis.

The diagnosis of non-specific ulcerative colitis is still to be made by ruling out other specific pathogenic conditions and the visualization through the sigmoidoscope of ulceration of the rectum and sigmoid. While the condition occasionally is segmental in type, ulceration occurs in the rectum in more than 95 per cent of the cases which makes visualization of ulceration through the sigmoidoscope possible in nearly all cases.

X-ray examination after an opaque enema usually gives negative findings especially in the acute condition. In recurrent chronic cases, lack of haustration may be noted, but it is not diagnostic of a specific condition.

Polyps.—Recurrent passage of red blood and mucus mixed in stools, especially in children, is the commonest sign of a single polyp in the rectum. Careful palpation during digital examination may easily reveal the condition, but this should be confirmed by visualization through the proctosigmoidoscope. Do not depend upon x-ray to determine or confirm these findings.

Pruritus Ani.—I wish to emphasize one other symptom or disease commonly met with in proctology that is often difficult to evaluate: pruritus ani! In my practice, I would estimate that about one out of every ten to fifteen patients complains of itching about the anus. The average physician seems to have a feeling of despair or lack of interest and disposes of this condition with a prescription for one of the many ointments or well-advertised suppositories or x-ray treatment. Although pruritus ani concerns many etiologic factors, I feel that more effort should be made to determine, if possible, the specific etiologic factor involved. This often involves the aid of the internist, allergist, dermatologist, neurologist, pathologist, psychologist, radiologist and proctologist.

In cases where the history, physical examination and laboratory tests have failed to determine the

etiologic factor and allergy is still a question, I often use the following elimination test:

Diet Water
Salt
Rice
Chicken
Coffee (black, one cup daily if desired)
Cotton clothing to be worn
Cotton as a cleansing agent
Nothing else externally or internally for seven days.

If there is no improvement by this time, it is needless to carry on further as it is probably not allergic. If the pruritus is relieved, the sixty-four dollar question is, what is the offending member?

Change the patient to nonallergic toilet articles and watch carefully for reaction to other contacts as they are replaced.

This test has been valuable to me in some of the most difficult cases. It is not very expensive and the patient may continue work. The diet becomes monotonous after a few days and it is often hard to get the patient to carry on, especially if he uses tobacco. The value of this test depends upon doing exactly what it says: "Nothing else externally or internally for seven days."

The role played by fungus infection in pruritus is questionable, and it is almost impossible to make a statement that has any definite value. A questionnaire of what per cent of pruritus ani is caused by fungi, was mailed by me to 1,000 doctors in the United States, from whom I received 269 replies, and the answers varied from none to 100 per cent. The average believed that it may be an etiologic factor in about 10 per cent of cases.

CONCLUSION

I hope this discussion will create more interest in this subject and the more frequent use of the many valuable proctologic procedures in examination.

DISCUSSION (*Abstract*)

Dr. C. Ross Deeds, Henderson, N. C.—Dr. Pruitt's statement that the average rectal examination is less complete than any other made by physicians or surgeons, cannot be successfully refuted. If a more thorough and complete routine examination were made, a reduction in the morbidity and mortality of cancer could be recorded; and if an intelligent examination were made more often, many other seemingly baffling and obscure rectal complaints could be eradicated, thereby relieving patients of local pathologic conditions and discomfort as well as removing foci of infection which have been sought after in every nook and crevice of the human carcass except here.

The taking of a comprehensive history is and should be a highly developed form of psychotherapeutic medicine. A good history need not be long or too detailed if the surgeon has the ability to sharpen his focus on what the patient is trying to tell. A good listener is highly entertaining. Nearly everyone likes to talk if he has a good audience. To maintain a positive physician-patient relationship one has to remain alert to all clues, correlate and by every word, action and demeanor encourage the discourse. At history taking time is the precise time to develop a friendly relationship. The more the patient reveals of his own personal and intimate life the closer his relationship with the doctor becomes. By all means take a good fact-finding history. Do all necessary things to merit the patient's continued confidence. There is no mystery to psychomatic medicine.

Next allow us to speak of the art of the gentle touch. This cannot be taught as one might teach the mechanics of our art. It is a subtle thing that belongs to the physical side of our being. At times it seems nearly as important as professional aptitude or scientific training. May I speak from personal experience? Give me the proctologist with the good, kind manner, the not unattractive personality, the gentle and assuring voice; but above all the warm soft hand which when it first touches the nates with assuring confidence tells the patient almost at once that his physician knows his work well; and that although the patient may have some discomfort he will do his very best to cooperate. Always remember that our anthropoidal heritage makes us fearful of any approach from the rear.

This area should be approached not only with knowledge and skill, but with gentleness, kindness and deep respect for the patient's hurts, as well as for the delicate tissues and the intricate functions. These are but a few of the practices that make proctology a much appreciated as well as a distinctive speciality.

Dr. James E. Ryan, Louisville, Ky.—I should like to point out a few incidental aides that we have incorporated in our present routine. While taking the patient's history we try to gain his confidence. Gentleness and vocal anesthesia are important adjuncts while conducting an examination but we oftentimes supplement it with topical anesthesia, especially if an anal lesion is visualized before instrumentation. We use 2 per cent "pontocaine" or occasionally a 10 per cent cocaine swab for a few minutes.

We prefer doing all routine examinations in an inverted position, using a Hanes table with a kneeling bench. I believe that all the Louisville hospitals now have available some type of inversion table for doing examinations and treatment. Occasionally, we use the Simms position for examination if there is a physical contraindication to inversion.

Naturally, the proper evaluation and interpretation of any abnormal finding disclosed by any of the four standard diagnostic procedures must be followed through to completion. One must have a visual mental picture of disease entities to be associated with various pathologic lesions. The number of potential possibilities increases under given conditions with increased knowledge, practice and observation.

Following biopsy removal of material from ulcerating masses we have found the use of tannic acid solution more beneficial and simpler than cautery to control nonarterial ooze. This is done by inserting 1 ounce of 10 per cent

tannic acid solution through the barrel of the scope. After 2 or 3 minutes the excess is aspirated.

In the case of suspected amebiasis we use occasionally sterile containers attached by tubing to the aspiration outfit. The tube is then inserted in a warm water bath and sent to the laboratory. Curette scrapings of ulcer beds are also used. The material is placed in a few drops of saline and handled likewise.

Pruritus ani had been likened to a merry-go-round in motion, the outside figures of the moving circle being comparable to the various approaches, and the inner figures to the numerous etiologic factors. One can mount the merry-go-round at numerous points. Allergy is certainly an important consideration. Dr. Pruitt's suggestions relative to the allergic approach are simple and practical. I do not believe that our incidence of pruritus would approach the 10 per cent patient load figure. Many of those that we see are second or third hand. In these the simpler procedures have been tried and the common etiologic influences investigated. Many times they are just shopping for someone to give them a prescription for the black salve that Dr. X gave them 5 years ago with complete freedom from symptoms in 2 days. Of course, Dr. X is always dead and left no records.

In addition to increased hygienic attention we are making more use of antihistamine preparations to aid in breaking up the itch scratch reflex arc. Occasionally, even with no demonstrable anorectal disease, in the face of intractable itch we do a modified Ball procedure, but continue to use antihistamine preparations supportively.

THE REGIONAL PROGRAM AND PARTICIPATION OF INSTITUTIONS PRESENTING A NEED*

By D. S. PANKRATZ, M.D.†
University, Mississippi

For the last three decades at least, the shortage of physicians in the South has been a problem. In Mississippi, it has become progressively alarming, and we now have approximately one doctor for every 2,000 people. During the last two years Mississippi has lost approximately one physician per week by death. The shortage of physicians is especially acute among our Negroes. We have only fifty-seven colored doctors for some 1,074,578 population, a ratio of 1 to 18,852. This probably closely represents the ratio existing in most of the Southern states.

Recently educators, legislators and the medical profession have taken steps to improve conditions. In 1945 the State of Mississippi asked Dr. W. T. Sanger to make a study of the medical, dental, and nursing education in our state. He did so, and in his splendid report he recommended, among other things, medical scholarships and a regional approach to our education problem. Alarmed by the shortage of physicians in Mississippi the state legislature of 1946 passed a liberal medical scholarship bill. This bill provides for a maximum loan of $5,000.00 to any needy man or woman who is a *bona fide* resident of Mississippi, who signs a contract with the state promising to practice at least two years in a rural area, and who has been accepted by an approved medical school in this country. Also in 1946 the Board of Trustees of the Institutions of Higher Learning of Mississippi asked the admissions committee of the School of Medicine, if it could increase the first year class from thirty to fifty students per year. With a liberally increased budget we felt that this could be done. Upon request the legislature voted an adequate increase in the budget and a class of fifty-six was admitted during the academic year of 1946-1947. From that date up to the present the University of Mississippi School of Medicine has admitted twenty-eight first year students twice a year, or each semester. I think that I am correct when I say that every medical school in this area has increased its student body within the past four years. Since Mississippi has only a two-year school and Florida has no medical school, the problem of getting our second year students transferred, and the first year students from Florida admitted to other schools, has become a difficult one. Simultaneously the number of eligible students who desire to study medicine has increased throughout the nation. At present, Mississippi has some 300 applicants, who are residents of the state with an average of C or better, but only 56 places per year in the freshman class. And we see very little indication that the number of good applications is going to decrease substantially in the near future. Furthermore, the number of failures among the medical students since the last war has been less than in previous times. This greatly influences the problem of Mississippi's transferring her students to the four-year schools. The schools to which we formerly transferred students tend to have fewer places in their junior classes. We have received numerous recent letters saying that the sophomore classes are rather large and that the failures are few. If schools in general all over the nation have enlarged their classes due to local pressure, Florida with no medical school no doubt has found it more difficult to place its fifty or more first year students.

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*Read in Section on Medical Education and Hospital Training, Southern Medical Association, Forty-Third Annual Meeting, Auspices Campbell-Kenton County Medical Society of Northern Kentucky, held in Cincinnati, November 14-17, 1949.

†Dean, University of Mississippi School of Medicine, University, Mississippi.

With the Negro student, conditions are even worse. There are only two medical schools which accept primarily Negroes. Their total enrollment was only 506 in 1948-1949, while the population of the Negro is high in all the states represented in this region (total 9,350,000, 1940 census). It is a well-known fact that relatively few Negroes are accepted at other medical schools throughout the nation. According to Dr. Donald G. Anderson, Secretary of the Council on Medical Education and Hospitals of the American Medical Association, there are 614 Negro medical students enrolled in the United States. There are probably some few eligible Negro candidates for schools of medicine in the states which now participate in this regional program, who will not be accepted somewhere. Since Meharry Medical College alone has entered into this regional program, we look for it to take the Negro students who will be certified by the various states. The total registration for 1948-1949 at Meharry was 231 medical students with 43 graduates. The total registration for the same year at Howard was 275 with 66 graduates. This means only 109 graduates and a few are not Negroes. Obviously the 13 Southern states present a critical condition with the need for better medical care ever on the increase. More Negro doctors should be trained. Any careful analysis will show that each Southern state could not afford to have its own medical school for the colored. And the number of eligible Negro students being educated in these states would not justify such expenditures. Thus the immediately practical and most efficient plan is to strengthen and expand the medical colleges now functioning in this area. Later other medical schools for Negroes properly located probably will be organized and constructed.

Chart 1 shows what Southern states have contracts with Meharry Medical College, and how many students have been certified from each state. It also shows the quotas that Meharry has allotted to the various states under this program.

I shall present the problem of transfer to four-year schools, as it has existed at the University of Mississippi School of Medicine during the past two years. In 1948 we graduated 52 students from the first two years. These students went to 17 different schools. Nineteen out of 52 or 36.5 per cent transferred to southern regional schools now signing contracts under this program. In 1949 we graduated 58 second year students and up to this time, they have all been transferred to 19 different schools. The data show that 32 or 55.2 per cent are going to schools in this region. I shall also compare the cost per student under the Southern Regional Program, with the average cost of education of a medical student in this country. The country's average cost of medical education for 1948-1949 was $2,557.00 per year per student. A student under the Regional Education Program pays fees at the contracting schools as designated on *Chart 2*, or an average of $515.00 per year. The regional contract calls for $1,500.00 to be paid by the state per year for each student, to the school which accepts the certified student. The total cost of $515.00 plus the $1,500.00, namely $2,015.00 per year is considerably less than the national average of $2,557.00.

On *Chart 2* are indicated the names of the states and schools which are accepting students under this program. The chart shows that Mississippi and Florida are contracting for students at Duke University, Emory University, Louisiana State University, Tulane University, University of Tennessee, Vanderbilt University and Meharry Medical College. Tuition or fees at the participating schools vary from $120.00 to $750.00 per academic year.

It is assumed that Florida plans to contract for a certain number of medical students in all the four years. Since Florida has contracted for 57 students at the institutions listed on *Chart 2*, such a program will cost $85,500.00 to the state, and about $30,000.00 in fees paid by its students, a total of $115,500.00 the first year. The second, the third,

States Who Have Certified Students* At Meharry Medical College	Number of Students
Georgia	16
Louisiana	8
Virginia	17
Maryland	5
Tennessee	17
Total	63

States To Whom Quotas Have Been Allocated by Meharry	Number of Students
Alabama	25
Florida	20
Mississippi	12
North Carolina	19
Oklahoma	12
South Carolina	10
Texas	34
Total	132

*The above figures apply to both medical and dental students.

Chart 1

ALLOCATION OF PLACES BY STATES AT DESIGNATED INSTITUTIONS

Names of Schools	Duke	Emory	Louisiana	Meharry	Tulane	Tennessee	Vanderbilt	Total
	$750	$600	$120	$495	$650	$375	$615	
Florida (first year)	6	17	—	20 (all 4 years)	10	—	6	57 x $1,500—$85,500.00
Mississippi (third year)	—	4	4	12 (all 4 years)	2	20	—	42 x $1,500—$63,000.00
Total	6	21	4	32	12	20	6	99

STATES CONTRACTING FOR SERVICES*

	First Year	Third Year	
Florida	40-50	—	50 x $1,500—$75,000.00 first year of program
Mississippi	10	25-30	40 x $1,500—$60,000.00 first year of program

*Data do not include Meharry Medical College.

Chart 2

and the fourth years, the program will cost approximately two, three and four times the above stated amount.

Mississippi has contracted for a maximum of 42 students at the above listed schools. For these students Mississippi will pay $63,000.00, and the students will pay $21,630.00 in fees, or a total of $84,630.00 for the first year; and about twice that amount the second year ($165,260.00). Furthermore, Mississippi desires to contract for ten medical students in the first year. These students will cost Mississippi an additional $15,000.00 per year. Florida, Mississippi and the other participating states have set up committees that will certify students for the Southern Regional Program. All students must be qualified citizens of the state which is to pay for their education. If a student is certified to a state school, such as the University of Tennessee, he pays the in-state tuition of $375.00 per academic year, and his home state pays the $1,500.00; while students not under the program pay the out-of-state fees, or $525.00 per year at the University of Tennessee. At the private or non-state schools the fees are the same for all students. Hence the student who is certified to a non-state school of medicine receives no financial benefits under the program, but is assured the transfer.

A disturbing factor to some is the fact that the state which sends the student and pays the $1,500.00 per year, has no assurance that the graduate will come back to practice in the home state. Fortunately, Mississippi has a scholarship program which will apply to many of its students. Under this program the student signs a contract with the state promising to return to general practice in a rural area for at least two years.

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EDITORIAL DEPARTMENT

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THYROID DEPRESSANT

Surgery has long been the accepted therapy for hyperthyroid conditions, and irradiation by x-ray or radium has been employed as well. Both remove or inactivate harmful tissue. Medical technics have been suggested in the past decade for reduction of the size and activity of the thyroid without either surgery or external radiation. One method is by the administration of thiouracil and related substances which prevent the uptake of iodine by the gland or the synthesis of thyroxin. Since atomic research has produced many radio-active isotopes of different physiologic affinities, and radio-active iodine has been shown to enter the thyroid selectively, study of irradiation from within with iodine^{131} has become popular in experimental literature.

A new element for the same work has recently been suggested.[1] Astatine^{211} (elements 85) is one of the products of nuclear fission studies, which has been shown to be concentrated in the thyroid gland in considerable quantity following ingestion, and which seems to offer several advantages as a source of radiant energy for thyroid destruction or depression. It has a half-life of only 7.5 hours, which makes it easier to control than the longer lived elements, such as radio-iodine with a half-life of eight days.

Unlike most of the artificial radio-active elements, astatine emits alpha particles of high kinetic energy. It thus has a great initial energy of irradiation, probably ten times that of radio-active iodine; and its rays are less penetrating, may better be confined to the cells at which they are aimed. Radio-iodine is about forty times more pentrating. Astatine may be so adjusted as to destroy the rat thyroid almost completely without injuring the adjacent parathyroids or other adjoining tissue. It is thus a more potent and accurate instrument for thyroid research.

Whether thyroid irradiation from either external or internal sources will long continue to be a useful clinical technic remains to be decided. At present there are no quick physiologic methods of reducing thyroid productivity. The nutritional field offers good preventive measures and sometimes even curative for thyroid hypertrophy. Hormones should eventually provide a more physiologic approach and more hope for normal restoration of this vital tissue. The anterior pituitary has a thyroid stimulating hormone, just as it has a gonad stimulating and an adrenal stimulating one. A medical control of overproduction of these anterior pituitary thyroid stimulators should not be too remote for hope.

ACTH AND THE PSYCHE

The adrenal glands, standing as they do by the exit gate of most of the soluble products of metabolism, the kidneys, are in a strategic position for controlling blood and urine levels of a number of metabolites. They have long been thought to be concerned with the stress reactions, the quick tightening of the muscles and alerting of the nervous system during fear or anger; and recent work has further confirmed belief in this mechanism and has demonstrated more of its physiologic details.

The fall of the lymphocytes and eosinophils during fatigue or other forms of stress has been much studied, and it has been noted that the same cell changes with similar blood chemical changes occur after ACTH or cortisone administration. Successful therapy of rheumatoid arthritis with ACTH and cortisone is reported to be associated with a marked increase in the sense of well being; and improvement of psychiatrically depressed patients has been reported following administration of these drugs. A recent number of the *American Journal of Psychiatry* contains several papers relating psychiatric disturbances to the changes observed in adrenal or anterior pituitary dysfunction. The stress responses

1. Hamilton, J. G.; Asling, C. W.; Garrison, W. M.; Scott, K. G.; and Axelrod-Heller, D.: Destructive Action of Astatine^{211} (Element 85) on the Thyroid Gland of the Rat. Proc. Soc. Exper. Biol. and Med., **73**:51 (Jan.) 1950.

of normal and schizophrenic[1] patients are compared; carbohydrate and lymph cell changes[2] in schizophrenics are reported; and adrenal cortical activity is estimated in psychoneurotics.[3]

In general, the psychotic patients did not give normal responses to stress, reacted as if there were an ACTH or cortisone deficiency. However, the patients were persons who had been in mental institutions for periods of many years. In this protected environment their stress reactions were of no use, and it would seem that in an institution stress reactions could do little but atrophy. Institutional life itself might initiate a chronic adrenal deficiency, resulting in practically complete disappearance of the normal stress changes.

Other blood studies after ACTH and adrenal hormones are of interest. Investigators[4] at the University of Utah have studied effects of ACTH and two adrenal products upon blood and urine levels of sodium, potassium and other materials, and upon the electroshock threshold of the central nervous system. Desoxycorticosterone, adrenal product employed in therapy of Addison's disease, raised the plasma sodium and the shock threshold, and depressed the plasma magnesium. ACTH had opposite effects: it reduced plasma sodium and shock threshold, and elevated the magnesium level, through its stimulating effect upon the cortical hormones. ACTH and DCA were antagonistic in the body. Desoxycorticosterone depressed ACTH secretion, and ACTH caused hypertrophy of the adrenals.

The anterior lobe of the pituitary is in a convenient post to receive sensory stimuli, following reactions of the organs of hearing, sight, touch, taste, feel. It is easy to believe that the sense organs stimulate the anterior pituitary to release of its internal secretions, one of which is ACTH. This in turn stimulates the adrenal laboratory to output of hormones needed for activity. The hormones mobilize chemicals which might otherwise be excreted in the urine. This is part of the mechanics of the reaction to sensory stimuli.

The field of mental aberration is a very complex one. It is possible that mental disorders as seen today are largely the result of continued failure of the individual's stress reactions or efforts, until ACTH is no longer secreted or no longer rises in response to the usual stimulation.

1. Pincus, Gregory; and Hoagland, Hudson: Adrenal Responses to Stress in Normal Men and in Those with Personality Disorders. I. Some Stress Responses in Normal and Psychotic Subjects. II. Analysis of the Pituitary-Adrenal Mechanism in Man. Amer. J. Psychiatry, **106**:641-651 (March) 1950.

2. Freeman, Harry; and Elmadjian, Fred: Carbohydrate and Lymphoid Studies in Schizophrenia. Idem. p. 660.

3. Cleghorn, R. A.; and Graham, B. F.: Studies of Adrenal Cortical Activity in Psychoneurotic Subjects. Amer. J. Psychiatry, idem. p. 668.

4. Woodbury, Dixon M.; Cheng, Chi-Peng; Sayers, George; and Goodman, Louis S.: Antagonism of Adrenocorticotrophic Hormone and Adrenal Cortical Extract to Desoxycorticosterone: Electrolytes and Electroshock Threshold. Amer. J. Physiology, **160**:217 (Feb.) 1950.

EXTRACTS FROM A NEW JOURNAL

A handsome addition to the specialists' literature is the recent first number of *Fertility and Sterility*,[1] official organ of the American Society for the Study of Sterility, edited by Pendleton Tompkins, of San Francisco.

The first number is beautifully prepared. It has a handsome color scheme and the best type recently seen in a journal, with numerous clear illustrations in color. The content will be of interest to all those concerned in the study of sterility, and to those who would glean an idea of the lines of investigation in this clinical field.

A paper on the thermogenic properties of progesterone has an appeal for endocrinologists. It has been demonstrated elsewhere that estrogen lowers and progesterone raises the body temperature of women. A sudden change in basal temperature at the midmenstrual phase is accepted as indicative of the date of human ovulation. In the rabbit a marked change in electric potential occurs with ovulation. The quantitative effects of estrogen and progesterone singly or in sequence in a group of castrate women are described in the new journal. A paper deals with the dating of the endometrial biopsy, the changing luminescence of female genitalia at different phases of the cycle, the control of ovulation in Macacus rhesus with discussion of the reasons why only one follicle matures per month, and the function of the atretic follicles; measurement of hyaluronidase as an estimation of the fertility of human sperm, through its correlation with the sperm count; a new pregnancy test; and a discussion of the sterile thyroid resistant woman.

One of the most interesting developments of current medical progress and medical literature is the growing number of publications upon specialists' subjects now appearing particularly in the United

1. New York: Paul B. Hoeber, Inc., 1950.

States for advancement of work in a particular field, such as sterility, the chest, the heart, tuberculosis, and cancer. No more even in the meetings of the general practitioner are discursive dissertations and orations on general subjects popular. Yet the overlapping interests and work of many specialties must contribute to sterility research.

TWENTY-FIVE YEARS AGO

From Journals of 1925

B. Abortus.[1]—In spite of the strong circumstantial evidence pointing to bovine sources of Malta fever infection in man, it was not until January, 1924 that the first authentic case of human infection with the abortus variety of the organism was reported from Baltimore by Keefer * * * The fact appears to be established that the agent of contagious abortion may infect man * * * Malta fever may simulate typhoid fever, tuberculosis or rheumatism.

Parathyroid Hormone.[2]—An extract has been made from the parathyroid glands of oxen by the use of which parathyroid tetany in dogs can be prevented or controlled * * * The active principle * * * produces its effect by causing the calcium content of the blood serum to be restored within normal limits * * * A very close parallelism has been observed between the clinical condition of experimental animals and the calcium content of the blood serum * * * Overdosage effects have been observed and the blood findings in this condition invariably show a condition of hypercalcemia * * * anorexia, vomiting, apathy, drowsiness verging into coma, and a failing circulation.

Food and Light.[3]—The last decade is likely to become notable in the history of the medical sciences because of its contributions to the history of nutrition * * * For some time it has been known that both codliver oil and certain types of radiant energy—the so-called ultra violet rays—may act in some subtle way as regulators of mineral metabolism, at least so far as calcium and inorganic phosphorus are concerned * * * they cause the organism to operate with increased economy * * * light can impart antirachitic properties to certain otherwise inert compounds * * * mirabile dictu * * * cholesterol * * * is readily activated in this way * * * cholesterol * * * has been regarded as chemically inert * * * The linking up of light with food factors and nutrition is a triumph of present day biochemical research.

Chemotherapeutics.[4]—The hope of securing a true therapia sterilisans magna has remained as a stimulus for many earnest endeavors * * * We refer to the elaborate report of Young and his confreres at Johns Hopkins Hospital, of attempts to produce an effective germicide for intravenous use. The outcome of several years of their collaborative investigation has been the production and trial of mercurochrome 220-soluble, a substance endowed with many unusual properties * * * Research is an enervating job; it is also a great gamble in which few win.

1. Editorial. Human Infections with Brucella Abortus. J.A.M.A., **84**:1047 (April 4) 1925.

2. Collip, J. B.: The Extraction of a Parathyroid Hormone Which Will Prevent or Control Parathyroid Tetany and Which Regulates the Level of Blood Calcium. J. Biol. Chem., **63**:395 (March) 1925.

3. Editorial. Light and Nutrition. J.A.M.A., **84**:1574 (May 23) 1925.

4. Editorial. Recent Chemotherapeutic Research. J.A.M.A., **84**: 1751 (June 6) 1925.

ERRATUM

An error occurred in the February number of the JOURNAL in the paper, "Geriatric Dermatology," by Drs. Kennedy, Henington, Ross and Hartwell, in the references to illustrations. On page 132, lower left column, *Fig. 1* should read *Fig. 2*; *Fig. 2* should be *Fig. 3*; and *Fig. 3* should be *Fig. 4*, and in the legend under *Fig. 4*, the reference to *Fig. 1* should have been to *Fig. 2*.

Book Reviews

Operations of General Surgery. By Thomas G. Orr, M.D., Professor of Surgery, University of Kansas School of Medicine, Kansas City, Kansas. Second Edition. 890 pages with 1,700 step-by-step illustrations on 721 figures. Philadelphia and London: W. B. Saunders Company, 1949. Price $13.50.

In this second edition of Orr's work, the excellent basic format of the original edition is preserved.

A splendid coverage of general surgical operations is presented and exceptionally well illustrated. Where indicated for clarification, a brief review of the pertinent anatomy is included; also the dangers and safeguards to be considered precede a description of the more important operations.

Appropriate revisions or additions to each chapter maintain the up-to-date standing of this work. New technics for blood vessel anastomosis and the treatment of thrombophlebitis and phlebothrombosis are described in the chapter on the circulatory system.

The outstanding contributions of Blalock and Gross in the treatment of congenital anomalies of the heart and great vessels are included. In the chapter dealing with the digestive system, new operative technics for rectal prolapse, esophago-gastrostomy, and repair of strictures of the bile ducts are described among others.

This second enlarged edition is comprehensive and well organized. A description of operations usually performed in the fields of the surgical specialties greatly enhances the book's value.

Tumors of Bone. Charles F. Geschickter, M.D., Professor of Pathology, Georgetown University Medical School, Washington, D. C., and Murray M. Copeland, M.D., Professor of Oncology, Georgetown University Medical School, Washington, D. C. Third Edition, 810 pages, 642 illustrations. Philadelphia, London and Montreal: J. B. Lippincott Company, 1949. Price $17.50.

The authors of this third edition of a classic manuscript have done an excellent work in bringing their book up to date. Twelve years have elapsed since the second edition went to press and in this period several clinical entities such

as fibrous dysplasia, osteoid osteomas and certain endocrine changes in bone have been recognized and described as clinical entities. The authors have devoted new chapters to these conditions, and, in addition, they have tabulated 500 additional cases more than were included in the previous work.

The additional information gleaned from study of the more recent literature and additional case records has been carefully worked into the text. The chapters on embryology of bone, condroblastomas, and the treatment of sarcoma of bone have been entirely rewritten. The entire volume is beautifully illustrated and numerous new illustrations have been added, in some cases replacing with clearer detail the older book.

This authoritative reference book has an excellent bibliography. The opinions of other authorities are carefully documented even when contrary to those of the authors.

Posttraumatic Epilepsy. By A. Earl Walker, M.D., Professor of Neurological Surgery, The Johns Hopkins University, Baltimore, Maryland. 90 pages, with illustrations. Springfield, Illinois: Charles C. Thomas, Publisher, 1949. Price $2.75.

This monograph reports present-day concepts of the neural mechanisms involved in posttraumatic epilepsy. The clinical picture is well presented, and the criteria for diagnosis are stated. Medical treatment, utilizing the newer anticonvulsant drugs alone or in combination with the barbiturates, is clearly outlined. The indications for surgical treatment and the technic of cortical exploration for an epileptogenic focus are described as essential prerequisites to adequate surgical extirpation.

The results of treatment are evaluated in follow-up reports. The relatively low incidence of posttraumatic epilepsy in penetrating wounds of the head in World War II is attributed to the improved surgical treatment of the wounds and to more effective anticonvulsant drugs.

The material is simply presented, making it suitable for reference by the general practitioner. Every neurologist and neurosurgeon will find this monograph useful and authoritative.

Ocular Signs in Slit-Lamp Microscopy. By James Hamilton Doggart, M.A., M.D. (Cantab), F.R.C.S. (Eng.), Surgeon and late Research Scholar, Moorfields, Westminster and Central Eye Hospital. 112 pages, illustrated. St. Louis: The C. V. Mosby Company, 1949. Price $6.75.

This small practical slit-lamp microscopy textbook proceeds without delay into the clinical aspects of this subject. The chapter on the technic of examination will be most helpful to a beginner. This is an accurate source book to refer to in the office for daily problems.

Since other small textbooks of slit-lamp microscopy are out of print and current ones in print are voluminous and expensive, it is predicted that this book will enjoy a wide circulation. The 85 color illustrations in this book of 100 pages are excellent, and the bibliography is quite detailed.

Dr. Doggart's excellent command of language is even better in this than in his book on eye diseases of childhood, and his delightful humor gleams through his scientific discourses.

Modern Practice in Ophthalmology, 1949. Edited by H. B. Stallard, M.B.E., M.A., M.D., F.R.C.S., Surgeon, Moorfields, Westminster and Central Eye Hospital, London; Eye Surgeon, St. Bartholomew's Hospital, London. 525 pages, with illustrations. New York: Paul B. Hoeber, Inc., 1949. Price $12.50.

This book is designed as a guide to which the general practitioner may refer when he shares with the eye specialist the responsibility of treating a case of ocular disease, and when he becomes responsible for an ophthalmic problem under conditions in which there may be a delay in obtaining the advice of a consultant.

Edited by H. B. Stallard, its fourteen author experts have written 21 chapters which present the essential elementary and at times advanced knowledge of the subjects discussed. Some, such as the chapter on conjunctivitis, are ample, in others, the inclusion of more details would have increased its value. The chapter on glaucoma would have been improved by stressing the necessity for early recognition of congenital glaucoma, and the good prognosis offered by goniotomy if performed early.

The book is set up in the same well-known and admired format used in both volumes of "Modern Trends in Ophthalmology." The large number of eye books now pouring forth from Great Britain makes one wonder if the onset of government medicine has stimulated British authors to produce new works.

The Child in Health and Disease. A Textbook for Students and Practitioners of Medicine. By Clifford G. Grulee, M.D., Rush Professor of Pediatrics, University of Illinois, and R. Cannon Eley, M.D., Associate in Pediatrics and Communicable Diseases, Harvard University Medical School. 1,060 pages with illustrations. Baltimore: The Williams and Wilkins Company, 1948. Price $12.00.

Not since the days of Osler and Holt has an author of consequence felt capable of covering the field of either medicine or pediatrics in a monograph. This is, of course, no reflection upon the capacity of the present-day authors but an admission by them that the current store of knowledge is too great to be comprehended and evaluated by an individual. The task of the authors of a book, as comprehensive as this, is one of choosing the proper person to present what may be called sub-specialties, and to reconcile any marked divergent opinions where such fields overlap.

It would be difficult to choose editors better suited to this undertaking. Dr. Grulee, in addition to having been an outstanding teacher of pediatrics, has also been the editor of the *American Journal of Diseases of Children* for many years. In this latter capacity he has edited most of the original contributions and become acquainted with the men who have made pediatric literature. Dr. Eley has also held important teaching positions in pediatrics and brings to this work the discriminative ability acquired through his experience as a teacher and investigator.

This is the latest complete textbook on pediatrics that has come to this reviewer's attention. Some fifty authors have collaborated with the result that every phase of pediatrics is presented authoritatively. It would be impossible to commend the book in detail because of its comprehensiveness, although such innovations as the chapters on surgical conditions and surgical principles in pediatrics,

describing preoperative and postoperative care, indicate the extent to which the authors have gone in covering the field. It is a very valuable volume.

Urological Aspects of Spinal Cord Injuries. By George C. Prather, M.D., Department of Genito-Urinary Surgery, Harvard Medical School, Boston, Massachusetts. 146 pages, illustrated. Springfield, Illinois: Charles C. Thomas, Publisher, 1949. Price $3.75.

This monograph by Dr. Prather is very timely and summarizes the rather widely divergent opinions as to the treatment of urinary disease following spinal cord injuries. About half occupies itself with the neurophysiology of the bladder which is of fundamental importance in the development of any rational approach to the problem. The various methods of therapy are described in detail, including intermittent catheterization, continuous catheterization, suprapubic cystostomy and tidal drainage.

The other disturbing genito-urinary complications, such as renal infections and calculi, cystitis and vesical calculi, as well as prostatitis and prostatic abscesses, are also discussed. Complications involving the external genitalia, such as epididymitis, periurethral abscess, urethral fistulae, priapism and impotence are adequately covered.

There is an excellent, although somewhat brief, chapter in which are summarized the results of treatment. This is quite comprehensive and appears to include most of the significant results which have been reported to date.

Lastly, there is a small section on military policy which is very interesting and describes in some detail some of the experiences encountered in the recent war.

Pathology and Surgery of Thyroid Disease. By Joseph L. DeCourcy, M.D., Senior Surgeon, Good Samaritan Hospital, Director, DeCourcy Clinic, Cincinnati, Ohio, and Cornelius B. DeCourcy, M.D., Member, DeCourcy Clinic Surgical Staff, Cincinnati, Ohio. 476 pages, illustrated. Springfield, Illinois: Charles C. Thomas, Publisher, 1949. Price $10.00.

This treatise on the thyroid gland has been written to correlate the wealth of newer knowledge of the thyroid and to organize in one volume the diverse manifold contributions of workers in the special field throughout the years. Its purpose has been admirably fulfilled.

So rapidly developing have been the studies in recent years upon the treatment of thyroid disease that a work offering a critical evaluation appears highly desirable. In the volume herein reviewed, the interesting historical background and embryology of the thyroid are included. In addition, the anatomy, physiology, and pharmacology are ably presented. A description of the pathologic features of the various thyroid diseases is exceptionally well done and is properly integrated with the body of the text.

Both the medical and surgical aspects of therapy are carefully considered by the authors and this represents probably the most valuable feature of the book. As a result of this comprehensive appraisal of all the newer methods of treatment, the reader emerges from the maze of conflicting views expressed in the literature with a much clearer conception of the entire picture. The relative merits of the use of radio-iodine, roentgen irradiation, the antithyroid drugs, and surgery in the treatment of abnormal thyroid states are clearly elucidated.

The methods of approach to the problems of hypo- and hyperthyroidism are presented in the light of a very extensive experience at the DeCourcy Clinic. Of particular significance is the section on anesthesia in thyroid surgery. This subject is deserving of the increased emphasis which this volume accords. Excellent descriptions of the pre- and postoperative care are included. Under the heading "Operative Considerations," a description of the exact operative technic employed, dependent upon the type of lesion encountered, is presented.

An extensive list of references constitutes an important feature of the book.

This outstanding work on the thyroid gland should prove a distinctly worthy addition to the library of the surgeon, pathologist, and internist.

The Clinical Examination of the Nervous System. By G. H. Monrad-Krohn, M.D., F.R.C.P., Professor of Medicine in the Royal Frederick University, Oslo. Ninth Edition. 459 pages, with illustrations. New York: Paul B. Hoeber, Incorporated, 1949. Price $6.50.

This volume is not intended as a textbook of clinical neurology but as an introduction to the examination of the nervous system. It is probably the most outstanding moderately priced volume in English on the examination of the nervous system. Some reviewers have criticized the frequent use of eponyms, but the author defends this through the justification of general use. A reviewer has said, "There is no such thing as the periosteal reflex of the costal margin." Monrad-Krohn replies "One cannot deny the existence of a phenomenon because one does not like the name given to it."

The author's use of the word "psychosomatic" (although explained in the preface) will be confusing to many American readers.

The difference between this edition and the preceding one is slight. Two pages have been added on electroencephalography and some material has been added to the section on angiography. A few of the neuro-anatomic illustrations leave something to be desired from an artistic standpoint.

The fact that this volume has run through nine editions and several reprintings since 1921 is a good indication of its increasing usefulness in the hands of all physicians concerned with diagnosis and treatment of diseases of the central nervous system.

A Textbook of Neuropathology. With Clinical, Anatomical and Technical Supplements. By Ben W. Lichtenstein, B.S., M.S., M.D., Associate Professor of Neurology, the University of Illinois College of Medicine. First Edition. 474 pages, with 282 figures. Philadelphia and London: W. B. Saunders Company, 1949. Price $9.50.

In this volume the author's effort to avoid the use of eponyms is to be commended. There is a brief lucid section on the general methods of fixation and staining which takes up the matter in informative generalizations, the actual technical details being set forth in a supplement at the end of the volume. In this volume instead of bombarding the

reader with a multitude of easily forgotten minor details the author points out important broad general principals, for instance: "The causes of disease are not seen in the gross and microscopic preparations—identical morphological alterations result from different causes"; and "the pathologist must decide which are the essential or primary changes and which are secondary or associated alterations." Of necessity his consideration of disease is essentially morphological and the methodology by which individual cases are considered will do much to clarify the subject of neuropathology in the mind of the student.

Major morphological alterations observed in the nervous system are classified as: (1) degeneration, (2) regeneration, (3) inflammation, (4) hemorrhage and vascular disease, (5) hydrops, (6) hyperplasia, (7) neoplasia, (8) malformation, (9) deformities and artefacts, and (10) adventitious substances. Each of these processes becomes the chapter heading in the book with the more commonly observed diseases of the nervous system considered in the appropriate section. The more rarely seen conditions and those which are more properly called syndromes than disease entities are covered briefly in an alphabetically arranged clinical supplement.

The bibliography is quite adequate for those who wish to pursue subjects covered in more detail.

The book was written primarily for the medical student, and for those training in neurology, psychiatry, pathology and neurological surgery. There are many well chosen illustrations. The type size seems a little small for prolonged reading.

Oral and Dental Diagnosis, with Suggestions for Treatment. By Kurt H. Thoma, D.M.D., F.D.S.R.C.S. Eng., Professor of Oral Surgery, Emeritus, and Brackett Professor of Oral Pathology, Harvard University. With contributions by Henry Goldman, D.M.D., Head of the Dental Department, Beth Israel Hospital, Boston; Fred Trevor, D.M.D., Formerly Instructor in Oral Pathology, Harvard Dental School. Third Edition. 563 pages, with 776 illustrations, 60 in color. Philadelphia and London: W. B. Saunders Company, 1949. Price $9.50.

In recent years dental teachers and practitioners have come to appreciate the importance of oral diagnosis and the subject has occupied an ever increasing position in the dental school curriculum. Since its first appearance in 1936, Thoma's "Oral and Dental Diagnosis" has been widely used both as a teaching and a reference text. In the intervening years the body of knowledge comprising the field has grown rapidly and the task of digesting and incorporating the numerous new clinical and laboratory findings has been a most difficult one. These circumstances are reflected in the present edition and could be overcome only by an exhaustive revision.

In many instances, important subjects have been dismissed with only brief comment; for example, hypoplasia of enamel. In other cases, information that seems superfluous is included; for example, laboratory tests which are readily available in more adequate form.

Although the text is profusely illustrated, many of the reproductions of photographs, particularly the intra-oral black and whites, are distinctly inferior and detract from the book's usefulness.

A bibliography of eighteen pages is appended in the rear of the book. Since the references are not designated by specific numbering in the text, are non-comprehensive, and are often grouped together (references for Chapters 1 to 12 are one section) this feature is of dubious value.

The book is nevertheless a valuable reference manual.

Heart. A Physiologic and Clinical Study of Cardio-Vascular Diseases. By Aldo A. Luisada, M.D., Instructor in Physiology and Pharmacology, Tufts College Medical School. 653 pages, with illustrations. Baltimore: The Williams and Wilkins Company, 1948. Price $10.00.

This book differs in several important respects from most standard texts on cardiology. The emphasis on the correlation between clinical and physiologic data, rather than clinical and pathologic, is an important advance in the study of heart disease. The extensive use of tables, line drawings, photographs, and the reproduction of graphic records has enabled the author to present his material in an understandable fashion. The field of heart disease is adequately covered.

The use of phonocardiography (graphic recording of heart sounds and murmurs) deserves special mention since this is the only general text on heart disease presenting this method extensively. While phonocardiography is not necessary for an adequate examination of the cardiac patient, its usefulness in illustrating or confirming the finer points of auscultation can hardly be denied. The author, because of his wide experience in this field, is well qualified to present this method of study.

As with most books, recent advances in this field are inadequately evaluated. The use of anticoagulants in the management of myocardial infarction is barely mentioned. In the chapter on hypertension the use of the rice diet, sodium restriction, and veratrum compounds is not mentioned at all.

This reviewer would like to take issue with the statement on page 79 that mecholyl is ever employed intravenously either as a pharmacologic test or as a therapeutic agent in man.

These minor criticisms do not detract materially from the general excellence of the text. It is a useful addition to the field of cardiovascular literature, and should serve as a valuable link between the preclinical and clinical years for the medical student.

Rehabilitation of the Handicapped. A Survey of Means and Methods. Edited by William H. Soden, Executive Assistant, Physical Medicine Rehabilitation Service, Veterans Administration Hospital, Northampton, Massachusetts. With a foreword by Sidney Licht, M.D., Editor, "Occupational Therapy and Rehabilitation." 399 pages. New York: The Ronald Press Company, 1949. Price $5.00.

Dr. Soden has chosen outstanding contributors in the various fields, and as a whole they have produced an excellent and timely summation of the various technics and facilities available in different communities. The extreme need for expansion of present work is clearly shown.

It would be impossible for one person to agree fully with twenty-two separate contributors and this reviewer is no

exception. Nevertheless here is a badly needed, carefully prepared, short work which contains a storehouse of useful information and should serve as a stimulus to both physicians and civic leaders to appraise their own contribution to the rehabilitation of the handicapped of their communities.

I sincerely believe that any thinking individual could gain much by carefully reading it. Certain chapters such as "How to Grow Old Gracefully," by Herman Seidel, represent literary and psychological masterpieces. On the whole this volume is heartily recommended for perusal by all physicians and humanitarian thinkers.

Physiology in Health and Disease. By Carl J. Wiggers, M.D., D.Sc., F.A.C.P., Professor of Physiology and Director of Physiology Department in the School of Medicine of Western Reserve University, Cleveland, Ohio. Fifth Edition. 1242 pages, with 280 engravings. Philadelphia: Lea and Febiger, 1949. Price $10.00.

For this new edition, Wiggers' textbook has been completely revised. One-third of the text has been entirely rewritten, and many of the illustrations are new. The author has made a serious effort to bring the book up to date; as a matter of fact, the purpose of incorporating late research appears to have been uppermost in his mind, and considerable space is devoted to its results.

The chapters on the physiology of blood and of the heart and circulation, which together comprise almost one-third of the volume, are, as may be expected, the most expertly written and comprehensive sections of this book. Among other recent advances, new material on bioelectric currents, blood flow through special organs, and the physiology of vision and hearing, as well as a brief chapter on the physiologic basis for psychosomatic reactions, have been included in this edition. A chapter on "Visceral Pain and Headache" contains an interesting review of the physiologic background of these clinical symptoms. The text is freely interspersed with footnotes referring to original work on the subject in question, and a great many new references have been added. Furthermore, a list of monographs and reviews is appended to each chapter, and these features are of value especially to those interested in further research. This is a scholarly textbook.

A Synopsis of Medicine. By Sir Henry Letheby Tidy, K.B.E., M.A., M.D., B.Ch. (Oxon.), F.R.C.P. (Lond.), Extra Physician to His Majesty The King. Ninth Edition. 1243 pages. Baltimore: The Williams and Wilkins Company, 1949. Price $7.50.

This is a carefully written and accurate account of the essentials of internal medicine. The pathology, etiology, symptoms, differential diagnosis, prognosis, and treatment of practically all medical diseases are briefly described. Though primarily designed for quick reference, the book contains some relatively extensive chapters, for instance, those on typhoid, tuberculosis, and epidemic encephalitis. The arrangement is exemplary.

In general, the paragraphs pertaining to differential diagnosis appear to be the most valuable part of this book; distinctive features of conditions with similar symptomatology are frequently given in outline form. Sections on vitamins and the sulfa drugs, penicillin, and streptomycin are likewise instructive. The most recent therapeutic methods, however, have not always been considered. In the treatment of syphilis, emphasis is still placed on arsenicals and bismuth. In leprosy, chaulmoogra oil is recommended, and the epochal sulfone drugs are simply designated as having given "promising results." The newer drugs now used in the treatment of epileptic seizures also do not receive sufficient attention.

Due to its brevity, this volume has only a limited range of usefulness. The author has stated this best himself, with the hope "that the book may be of assistance to those who have to revise rapidly their knowledge of medicine in general or of some disease in particular; to the worried student whose final examinations are within sight and to the hurried practitioner whose ken they have long passed." Thus, it cannot, and was not intended to, replace a textbook of internal medicine, but it is of value, particularly to the medical student, for review and for purposes of reference in the field of internal medicine.

A Textbook of Surgery. By American Authors. Edited by Frederick Christopher, B.S., M.D., F.A.C.S., Professor of Surgery, Northwestern University Medical School. Fifth Edition. 1550 pages, with 1465 illustrations on 742 figures. Philadelphia and London: W. B. Saunders Company, 1949. Price $13.00.

The fifth edition of Christopher's surgery is an improvement on possibly the best general textbook of surgery in print. Much of the material remains unchanged, with some new sections and some extensive revisions.

An alteration in the arrangement of some of the sections has been made. A presentation of the basic sciences as pertaining to surgery before a consideration of diagnosis and surgical problems seems logical.

Over two hundred pages are devoted to orthopedics. Each page contains something worthwhile which would almost qualify this book as a text on orthopedics.

The section referring to the stomach and duodenum is most interesting. Waugh's revision of Balfour's discussion of tumors of the stomach is well presented. Injuries of the small and large intestine is a section that is outstanding. Hernia is a subject sometimes taken too lightly but in this text the subject is discussed in the light of its full importance. Each type is taken up separately and fully described.

Other sections too numerous to mention are also excellent.

It is true of all textbooks that they are out of date by the time they are in print and this is true, in part, of this one. An outstanding example of this is the section on antibiotics. This field is enlarging so rapidly it is impossible to keep pace with it.

The only word of criticism regarding the entire book is that the references, especially to those sections not specifically revised or entirely new, seem for the most part to be the same as in previous editions. Surely something new has appeared in the literature on almost every subject covered in this book. Granted it is not an "index medicus," it would seem that each contributor should endeavor to bring his section reasonably up to date.

This fifth edition keeps Christopher's textbook of surgery the best in its field.

Southern Medical News

ALABAMA

A proposed 60-bed Negro Hospital, to be staffed by Negro physicians and for the exclusive use of Negro citizens, is to be located in Birmingham. A drive is being launched to raise $150,000 which, added to $100,000 already subscribed to privately, will make possible an additional grant of $500,000 from the Federal Government.

Dr. Roger D. Baker, Birmingham, Chief Pathologist, Medical College of Alabama, is President of the Alabama Heart Association, the March issue of the JOURNAL being in error in this news column in indicating Dr. Baker as retiring president and giving the name of another physician as president.

Dr. Morgan W. Brown, Birmingham, has been named Director of Student Health, Alabama Polytechnic Institute, Auburn, succeeding Dr. John T. Strickland. Dr. Louis Edgar Beckham, Jr., Charleston, South Carolina, is the new Assistant Director, succeeding Dr. Crayton C. Fargason.

Dr. H. Earle Conwell, Birmingham, is a new member of the Robert Jones Orthopaedic Club, a selective group of twenty-five orthopaedic surgeons in Canada and the United States who had their training under Sir Robert Jones, of England, during World War I.

Dr. W. B. Mims, Jr., Phenix City, has been appointed Acting Health Officer, Russell County, to succeed the late Dr. R. W. Todd.

ARKANSAS

Dr. John E. Laman has been appointed City Health Officer of Little Rock.

Dr. Ray Fulmer, Little Rock, has been appointed President of the Junior College Alumni Association.

Dr. T. H. Jones has returned to Waldo from Seminole, Oklahoma, for the practice of medicine.

DISTRICT OF COLUMBIA

Dr. Daniel L. Borden, Clinical Professor of Surgery, George Washington University, School of Medicine, Washington, was presented the George Washington University Medical Society's Award of Merit at its Annual Banquet and Alumni Reunion on February 25.

Dr. Ronald Atmore Cox has been appointed Professor of Ophthalmology and Executive Officer of the Department of Ophthalmology, George Washington University School of Medicine, Washington, and Chief of Department of Ophthalmology, George Washington University Hospital, replacing Dr. Ernest A. W. Sheppard in all these positions. Dr. Sheppard resigned to devote more time to research, but he will continue to teach at the School.

Dr. Robert M. Hall, Washington, has been appointed Secretary of the American Medical Association's Council on National Emergency Medical Service.

Dr. Fred L. Soper, Washington, Director, Pan American Sanitary Bureau, was awarded the Theobald Smith Gold Medal at a joint meeting of the American Society of Tropical Medicine, the American Academy of Tropical Medicine and the National Malaria Society.

Dr. John P. Carter, Washington, and Miss Mary Victor Blanchard, Wallace, North Carolina, were married recently.

The January issue of *American Annals of the Deaf* gives information on the education of the deaf which would prove very helpful to parents and teachers of deaf children. Requests for this issue should be sent to Editor, American Annals of the Deaf, Gallaudet College, Washington 2, D. C. The price of the January issue is $1.00; yearly subscription, $2.00.

FLORIDA

Florida Chapter, American College of Chest Physicians, will hold its annual meeting in Hollywood, April 23.

Dr. DeWitt C. Daugherty has opened offices in Miami with practice limited to thoracic surgery and broncho-esophagology. He was formerly Chief of Thoracic Surgery at McGuire General Hospital, Richmond, Virginia.

Dr. Howard G. Holland, Leesburg, and Dr. Carl D. Hoffman, Orlando, have returned from England where they made a first-hand study of state medicine as now being practiced in that country.

Dr. Henry Feintuch, Miami Beach, and Miss Harriet Rebhun, New York City, were married recently.

GEORGIA

Georgia Heart Association Fifth District Chapter, Atlanta, was organized recently and the following officers elected: Dr. Joseph C. Massee, President; Dr. J. Gordon Barrow, Vice-President; and Dr. C. Purcell Roberts, Secretary-Treasurer, all of Atlanta.

Dr. Laurence B. Dunn, Savannah, succeeds Dr. John E. Porter as President of the Staff of St. Joseph's Hospital, Savannah. Dr. Dunn's father, the late Dr. Matthew F. Dunn, was the first president and served for some years as head of the hospital staff. Dr. Porter will continue as a member of the staff.

Dr. Charles H. Daniel, College Park, was recently elected President, Section of Obstetrics and Gynecology of Crawford W. Long Memorial Hospital, Atlanta; and Dr. A. Worth Hobby, Atlanta, was elected Chairman of the Medical Section.

Dr. Samuel A. Heaton, Augusta, has opened an office in the Bleckley Building, Clayton.

Dr. Charles S. McCall, formerly of Bennettsville, South Carolina, has opened an office in Albany for the practice of internal medicine.

Dr. W. D. Lundquist, who previously served with the Georgia Department of Public Health at Statesboro and Waynesboro, is the new Regional Medical Director with headquarters in Augusta.

Dr. W. H. Lewis, Rome, has been named Director of the Floyd Hospital, Rome. He practiced at Rome for more than forty-three years.

Dr. Frank B. Mitchell, Jr., Metter, has opened an office at Brunswick for the practice of medicine and surgery.

Ware County Board of Health, Waycross, has named Dr. W. C. Hafford, Chairman of the Board and Commissioner of Health.

Dr. John H. Venable, Dalton, has resigned as Health Commissioner of Whitfield and Murray Counties to become Health Commissioner of Spalding, Lamar and Pike Counties.

Dr. Paul T. Scoggins, Commerce, has been elected Mayor of Commerce for a term of two years.

Dr. J. R. Sams, Covington, has been appointed Surgeon for the Georgia Railroad.

Dr. Hubert U. King, Nicholls, has been named Health Commissioner for Jenkins, Burke and Screvens Counties.

Dr. T. C. Davison, Atlanta, was installed President, American Goiter Association at its annual meeting held in Houston, Texas, March 9-11.

Dr. W. J. Peeples, has resigned as Health Officer of Troup County and has assumed duties of Assistant Commissioner of Health for Muscogee County. His wife, Dr. Margaret Olsen Peeples, will do part-time work with the Muscogee County Department of Public Health.

Cobb Memorial Hospital, Royston, a 23-bed hospital constructed at a total cost of $216,000, was recently dedicated by Mr. Tyrus Raymond Cobb, baseball's famed Georgia Peach, and its name honors his parents, Professor and Mrs. Herschel Cobb of Royston. Mr. Tyrus Raymond Cobb gave more than $100,000 toward construction of the medical center. Dr. Stewart D. Brown, Royston, his lifelong friend, is Superintendent of the Hospital, and Mrs. Brown is Secretary-Treasurer.

A branch of the Scientific Research Society of America has been installed at the Communicable Disease Center, U. S. Public Health Service, Atlanta, this being the sixth branch to be established in the United States. Dr. R. A. Vonderlehr, Medical Director in Charge of the Communicable Disease Center, was elected the first President; Dr. Justin M. Andrews, Vice-President; Dr. Marion M. Brooke, Secretary-Treasurer; and Dr. George H. Bradley and Dr. Wilton M. Fisher, Executive Committee members.

Dr. John Christian Ransmeier and Miss Frances Ellen Starnes, both of Atlanta, were married recently.

KENTUCKY

Kentucky Society of Pathologists has elected Dr. Harry M. Weeter, President; Dr. Malcolm L. Barnes, Secretary; and Dr. Aura J. Miller, Curator.

Dr. Alex J. Steigman, Cincinnati, Ohio, has been appointed Professor of the first Chair of Child Health in the United States under the Department of Pediatrics, University of Louisville School of Medicine, Louisville.

Middlesboro Clinic and Hospital Group, Middlesboro, announce the full-time association of Dr. Waller H. Griffing.

Dr. George H. Widener, Jr., has located at Paducah, practice limited to ophthalmology.

Dr. Walter L. Boswell, Dr. James S. Hewlett and Dr. James T. McClellan have become associated with the Lexington Clinic, Lexington.

Dr. Donald L. Graves, formerly of Ary, has moved to Frenchburg.

Dr. Jeanne B. Blumhagen has located at Fedscreek.

Dr. Robert L. Shuffett has joined the staff of the State Hospital, Danville.

Dr. Leslie W. Blakey, formerly associated with the Hopkinsville Clinic, Hopkinsville, has opened an office for private practice of medicine at Cadiz.

Dr. John W. Somerville, formerly of Woodburn, is associated with Dr. Sam A. Overstreet in the Heyburn Building, Louisville.

Dr. John P. Bell has opened an office in the Heyburn Building, Louisville, practice limited to psychiatry.

Dr. Robert N. McLeod is associated with the Somerset Clinic in charge of the Pediatric Division, Somerset.

Dr. Patrick W. Cummings succeeds Dr. Eleanor W. Townsend as pathologist at the Kentucky Baptist Hospital, Louisville. Dr. Townsend is pathologist in the Veterans Administration Hospital, Mountain Home, Tennessee.

Dr. W. W. Nicholson, State Chairman, American Academy of Pediatrics, has announced that the annual spring postgraduate course at Children's Hospital, Louisville, in cooperation with the Department

MEDICAL NEWS continued on page 62

SOUTHERN MEDICAL ASSOCIATION

Minutes* of Forty-Third Annual Meeting

Cincinnati, Ohio, November 14-17, 1949

GENERAL CLINICAL SESSION MEDICINE

Monday, November 14, 2:00 p.m.

A General Clinical Session, Medicine, was held at the Netherland Plaza Hotel, Pavillon Caprice, Cincinnati, honoring the Host Society, the Campbell-Kenton County Medical Society of Kentucky, program arranged by Dr. Oscar B. Hunter, President, Southern Medical Association, Washington, D. C., Dr. Robert L. Biltz, President, Campbell-Kenton County Medical Society, Newport, Kentucky, presiding.

The following presentations were made:

Dr. P. S. Hench, Dr. E. C. Kendall, Dr. C. H. Slocumb and Dr. H. F. Polley, Mayo Clinic, Rochester, Minnesota: "The Effect of Cortisone and ACTH on Rheumatoid Arthritis" (Lantern Slides and Motion Pictures), paper being read by Dr. Polley.

Dr. Theodore E. Woodward, Associate Professor of Medicine, University of Maryland School of Medicine, Baltimore, Maryland: "The Present Status of Chloramphenicol (Chloromycetin) in the Treatment of Infectious Diseases" (Lantern Slides and Motion Pictures), discussed by Dr. J. C. Edwards, St. Louis, Missouri; and in closing by the essayist.

Dr. Louis Faugeres Bishop, Jr., Assistant Clinical Professor of Medicine, New York University, Bellevue Medical Center; Visiting Physician, Bellevue Hospital; and Attending Cardiologist, Kingsbridge Veterans Hospital, New York, New York: "Psychosomatic Aspects of Heart Disease," which was discussed by Dr. David I. Macht, Baltimore, Maryland; and in closing by the essayist.

Dr. Francis M. Pottenger, Jr., Associate Medical Director, and Director of Department of Research, The Pottenger Sanatorium and Clinic, Monrovia, California: "A Common Form of Fat Dyscrasia, Rough Skin" (Lantern Slides).

Dr. Edwin M. Robertson, Professor of Obstetrics and Gynecology, Queen's University, Kingston, Ontario, Canada: "Dysmenorrhoea."

Dr. Edwin C. Hamblen, Professor of Endocrinology and Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine, and Chief, Endocrine Division, and Endocrinologist, Duke Hospital, Durham, North Carolina: "'Endocriminology' or Endocrinology" (Lantern Slides).

The Session then adjourned *sine die*.

GENERAL CLINICAL SESSION SURGERY

Monday, November 14, 2:00 p.m.

A General Clinical Session, Surgery, was held at the Netherland Plaza Hotel, Hall of Mirrors, Cincinnati, honoring the Host Society, the Campbell-Kenton County Medical Society of Kentucky, program arranged by Dr. Oscar B. Hunter, President, Southern Medical Association, Washington, D. C., Dr. J. Gay VanDermark, President-Elect, Campbell-Kenton County Medical Society, Covington, Kentucky, presiding.

The following presentations were made:

Dr. Curtice Rosser, Professor of Proctology, Southwestern Foundation Medical College; Chief, Proctology Staff, City-Council Hospital; and Proctologist, Baylor University Hospital, Dallas, Texas: "An Appraisal of Current Therapy for Pruritus Ani" (Lantern Slides), which was discussed by Dr. Joseph W. Kelso, Oklahoma City, Oklahoma; Dr. R. L. Murdoch, Oklahoma City, Oklahoma; and in closing by the essayist.

Dr. Custis Lee Hall, Clinical Professor of Surgery, George Washington University School of Medicine; and President, International College of Surgeons, Washington, D. C.: "The Modern Concept of Orthopedic Surgery."

Dr. Lloyd G. Lewis, Professor of Urology, Georgetown University School of Medicine, Washington, D. C.: "Prostatism" (Lantern Slides), which was discussed by Dr. V. V. Smith, Ironton, Ohio; Dr. Curtice Rosser, Dallas, Texas; and in closing by the essayist.

Dr. W. Wayne Babcock, Surgeon, Temple University Hospital; Emeritus Professor of Surgery, Temple University; Active Surgical Consultant, Philadelphia General Hospital, Philadelphia, Pennsylvania: "The Surgical Treatment of Aortic Aneurysm."

Dr. Paul Banzet, Chirurgien de L'Hopital Broussais; Membre de L'Academie de Chirurgie, Paris, France: "The Treatment of the Complications of Gastroduodenal Ulcers."

Dr. Elmer L. Henderson, President-Elect, American Medical Association, and Past President, Southern Medical Association; and Dr. J. Luther Fuller, Instructor of Surgery, University of Louisville School of Medicine, Louisville, Kentucky: "Management of the Acute Gallbladder" (Lantern Slides), was read by Dr. Fuller.

The Session then adjourned *sine die*.

SECTION ON GENERAL PRACTICE

Officers

Chairman—Dr. Steve P. Kenyon, Dawson, Georgia.
Vice-Chairman—Dr. David G. Miller, Jr., Morgantown, Kentucky.
Secretary—Dr. W. H. Anderson, Booneville, Mississippi.

Tuesday, November 15, 9:00 a.m.

The Section met in the Sinton Hotel, Ballroom, Cincinnati, and was called to order by the Chairman, Dr. Steve P. Kenyon, Dawson, Georgia, who presided.

Dr. John R. Bender, Winston-Salem, North Carolina, read a paper entitled "Office Examination in General Practice," which was discussed by Dr. W. G. Elliott, Cuthbert, Georgia; Dr. David G. Miller, Jr., Morgantown, Kentucky; and Dr. W. H. Anderson, Booneville, Mississippi.

In the absence of Dr. Euclid M. Smith, Hot Springs National Park, Arkansas, due to illness, the subject "What the General Practitioner Should Know About Rheumatoid Arthritis" was presented by Dr. Tom D. Spies, Birmingham, Alabama.

Dr. Roy R. Kracke, Dean, Medical College of Alabama, Birmingham, Alabama, presented the subject "Hematology in General Practice."

Dr. Steve P. Kenyon, Dawson, Georgia, read his Chairman's Address, entitled "The Doctor's Obligation to His People."

Dr. Samuel F. Ravenel, Dean, Southern Pediatric Seminar, and Chairman, Section on Pediatrics, Southern Medical Association, Greensboro, North Carolina, presented the subject "Practical Points in Pediatrics for the General Practitioner," which was discussed by Dr. Gene Sims, Selma, Alabama; and in closing by the essayist.

Dr. R. B. Robin, Professor of Medical Economics, University of Arkansas School of Medicine, Little Rock; and Speaker, Congress of Delegates, American Academy of General Practice, Camden, Arkansas, read a paper entitled "Why Medical Economics?" (Lantern Slides), which was discussed by Dr. Frank M. Acree, Greenville, Mississippi.

The Chairman appointed the following Nominating Committee: Dr. Lowry H. McDaniel, Chairman, Tyronza, Arkansas; Dr. John R. Bender, Winston-Salem, North Carolina; and Dr. Stanley A. Hill, Corinth, Mississippi.

The Section then adjourned until 9:00 a.m. Wednesday.

Wednesday, November 16, 9:00 a.m.

The Section met in the Sinton Hotel, Ballroom, Cincinnati, and was called to order by the Chairman, Dr. Kenyon, who presided.

Dr. Charles T. Berry, Greenville, Mississippi, read a paper entitled

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*Here are minutes of the General Clinical Sessions, of the twenty-one sections, of the conjoint meetings, and of the Woman's Auxiliary for the meeting of the Southern Medical Association held in Cincinnati under the auspices of the Campbell-Kenton County Medical Society of Northern Kentucky. In the next issue of the JOURNAL (May) will appear the remainder of the record of the Cincinnati meeting—minutes of the General Sessions, Report of the Council, and other reports.

"Intramedullary Nailing of Femur and Other Long Bones" (Motion Pictures), which was discussed by Dr. Stanley A. Hill, Corinth, Mississippi.

Dr. J. Elliott Scarborough, Director, Robert Winship Memorial Clinic, Emory University School of Medicine, Emory University, Georgia, presented motion pictures on "Care of the Cancer Patient in General Practice."

Dr. Philip Thorek, Clinical Assistant Professor of Surgery, University of Illinois College of Medicine, and Associate Professor of Surgery, Cook County Graduate School of Medicine, Chicago, Illinois, read a paper entitled "The Acute Abdomen."

Dr. Mervin H. Grossman, Assistant Chief Pathologist, Veterans Hospital and Instructor in Pathology, Baylor University College of Medicine, Houston, Texas, read a paper entitled "The Autopsy as Related to the General Practitioner," which was discussed by Dr. Lowry H. McDaniel, Tyronza, Arkansas; Dr. G. E. Johnson, Ardmore, Oklahoma.

Dr. Neal Owens, Professor of Surgery, Tulane University School of Medicine, New Orleans, Louisiana, read a paper entitled "Plastic Surgery as an Aid to the Solution of Some Common Problems in General Practice" (Lantern Slides).

Dr. Frank E. Whitacre, Head, Department of Obstetrics, University of Tennessee College of Medicine, Memphis, Tennessee, read a paper entitled "Obstetrics for the General Practitioner," which was discussed by Dr. Willis E. Brown, Little Rock, Arkansas.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. David G. Miller, Jr., Morgantown, Kentucky.
Vice-Chairman—Dr. Owen H. Williams, Savannah, Tennessee.
Secretary—Dr. W. H. Anderson, Booneville, Mississippi.

The Section then adjourned *sine die*.

SECTION ON MEDICINE

Officers

Chairman—Dr. E. Sterling Nichol, Miami, Florida.
Vice-Chairman—Dr. J. Murray Kinsman, Louisville, Kentucky.
Secretary—Dr. Harold M. Horack, New Orleans, Louisiana.

Wednesday, November 16, 9:00 a.m.

The Section met in the Netherland Plaza Hotel, Pavillon Caprice, Cincinnati, and was called to order by the Chairman, Dr. E. Sterling Nichol, Miami, Florida, who read his Chairman's Address, entitled "Anticoagulant Therapy in Coronary Insufficiency with Remarks on Impending Coronary Thrombosis."

Paper by Dr. Sam T. McIlvaine, Dr. Maurice Nataro and Dr. Marion F. Beard, Louisville, Kentucky, entitled "Effects of Vitamin B_{12} on Pernicious Anemia in Remission," was read by Dr. Beard, and was discussed by Dr. E. Sterling Nichol, Miami, Florida; Dr. Tom D. Spies, Birmingham, Alabama; Dr. Carl H. Fortune, Lexington, Kentucky; and in closing by Dr. Beard.

Dr. William Parson, Professor of Medicine, University of Virginia School of Medicine, Charlottesville, Virginia, read a paper entitled "Obesity: An Endocrine or a Psychogenic Disorder?" which was discussed by Dr. E. Sterling Nichol, Miami, Florida; Dr. Bert F. Keltz, Oklahoma City, Oklahoma; Dr. Francis M. Pottenger, Monrovia, California; Dr. M. J. Flipse, Miami, Florida; and in closing by the essayist.

Paper by Dr. Bert F. Keltz, Dr. E. Corinne Keaty (Ph.D.) and Dr. Arthur A. Hellbaum, Departments of Medicine and Pharmacology, University of Oklahoma School of Medicine, Oklahoma City, Oklaboma, entitled "Hormonal Studies in Diabetic Pregnancies," was read by Dr. Keltz, and was discussed by Dr. William R. Jordan, Richmond, Virginia; Dr. William Parson, Charlottesville, Virginia; Dr. Walter E. Vest, Huntington, West Virginia; and in closing by Dr. Keltz.

Dr. Harry F. Dowling, Clinical Professor of Medicine, George Washington University School of Medicine, Washington, D. C., read a paper entitled "Recent Advances in Antibiotic Therapy" (Lantern Slides), which was discussed by Dr. George T. Harrell, Winston-Salem, North Carolina; Dr. Douglas H. Sprunt, Memphis, Tennessee; and in closing by the essayist.

Paper by Dr. William D. Davis, Jr., and Dr. Henry Laurens, Jr., Department of Medicine, Tulane University and Ochsner Clinic, New Orleans, Louisiana, entitled "The Correlation of Liver Function Tests and Liver Biopsy in Hepatic Disease," was read by Dr. Davis, and was discussed by Dr. Franklin B. Moosnick, Lexington, Kentucky; Dr. Carl W. Kumpe, Cincinnati, Ohio; Dr. M. Jay Flipse, Miami, Florida; Dr. Donald F. Marion, Miami, Florida; and in closing by Dr. Davis.

The Chairman appointed the following Nominating Committee: Dr. Daniel L. Sexton, Chairman, St. Louis, Missouri; Dr. George T. Harrell, Winston-Salem, North Carolina; and Dr. Edgar Hull, New Orleans, Louisiana.

The Section then adjourned until 9:00 a.m. Thursday.

Thursday, November 17, 9:00 a.m.

The Section met in the Netherland Plaza Hotel, Pavillon Caprice, Cincinnati, and was called to order by the Chairman, Dr. Nichol, who presided.

Paper by Dr. Robert Dean Woolsey, Instructor in Surgery, and Dr. James B. Stubbs, Instructor in Internal Medicine, St. Louis University School of Medicine, St. Louis, Missouri, entitled "Angina Pectoris: Treatment by Stellate Ganglion Block with Ammonium Sulfate," was read by Dr. Woolsey, and was discussed by Dr. William J. Atkinson, Mobile, Alabama; Dr. Donald W. Smith, Miami, Florida; Dr. E. Sterling Nichol, Miami, Florida; and in closing by Dr. Woolsey.

Paper by Dr. Ernest Yount and Dr. Marvin Rosenblum, Department of Internal Medicine, Bowman Gray School of Medicine, Wake Forest College, Winston-Salem, North Carolina, entitled "Studies of Plasma Quinidine Levels in Relation to Therapeutic Effect and Toxic Manifestations" (Lantern Slides), was read by Dr. Yount, and was discussed by Dr. Harold Kotte, Cincinnati, Ohio; Dr. A. A. Herold, Shreveport, Louisiana; Dr. Edgar Hull, New Orleans, Louisiana; Dr. E. Sterling Nichol, Miami, Florida; and in closing by Dr. Yount.

Paper by Dr. Samuel B. Nadler, Senior Physician, Touro Infirmary, and Associate Professor of Medicine, Tulane University School of Medicine, and Sybil Gordon, Joseph Hume Research Laboratory, Touro Infirmary, New Orleans, Louisiana, entitled "The Black Test in the Diagnosis of Malignant Disease," was read by Dr. Nadler.

Paper by Dr. M. Eugene Flipse, Dr. Jack L. Wright and Dr. M. Jay Flipse, Departments of Pathology and Medicine, Jackson Memorial Hospital, Miami, Florida, entitled "Acute Renal Insufficiency (Lower Nephron Nephrosis)" (Lantern Slides), was read by Dr. M. Eugene Flipse, and was discussed by Dr. Arthur J. Butt, Pensacola, Florida; Dr. J. F. A. McManus, Birmingham, Alabama; Dr. Paul Kimmelstiel, Charlotte, North Carolina; and in closing by Dr. M. Eugene Flipse.

Paper by Dr. Bert H. Wiesel, Assistant Professor of Medicine, and Dr. J. F. A. McManus, Associate Professor of Pathology, The Medical College of Alabama, Birmingham, Alabama, entitled "A Challenge in the Management of Diabetes: Necrotizing Renal Papillitis," was read by Dr. Wiesel, and was discussed by Dr. Paul Kimmelstiel, Charlotte, North Carolina; and in closing by Dr. Wiesel.

Dr. Lay Martin, Assistant Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland, read a paper entitled "Studies on the Pattern of Potassium and Other Electrolytes of Gastric Juices During Secretion; Effect of Prolonged Loss of Stomach Juices on Body Potassium" (Lantern Slides), which was discussed by Dr. Meyers Hicks, Charlottesville, Virginia.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Alphonse McMahon, St. Louis, Missouri.
Vice-Chairman—Dr. Carter Smith, Atlanta, Georgia.
Secretary—Dr. Harold M. Horack, New Orleans, Louisiana.

The Section then adjourned *sine die*.

SECTION ON GASTROENTEROLOGY

Officers

Chairman—Dr. Gordon McHardy, New Orleans, Louisiana.
Vice-Chairman—Dr. Bruce D. Kenamore, St. Louis, Missouri.
Secretary—Dr. Donald F. Marion, Miami, Florida.

Wednesday, November 16, 2:00 p.m.

The Section met in the Netherland Plaza Hotel, Pavillon Caprice, Cincinnati, and was called to order by the Chairman, Dr. Gordon McHardy, New Orleans, Louisiana, who presided.

The Chairman appointed the following Nominating Committee: Dr. Julian M. Ruffin, Chairman, Durham, North Carolina; Dr. Walter R. Johnson, Asheville, North Carolina; Dr. James L. Borland, Jacksonville, Florida; and Dr. Cecil O. Patterson, Dallas, Texas.

Dr. Henry G. Rudner, Memphis, Tennessee, read a paper entitled "Prolapse of Gastric Mucosa Simulating Peptic Ulcer" (Lantern Slides), which was discussed by Dr. J. E. Whiteleather, Memphis, Tennessee; Dr. John Tilden Howard, Baltimore, Maryland; Dr. R. L. Sanders, Memphis, Tennessee; Dr. Julian M. Ruffin, Durham, North Carolina; and in closing by the essayist.

Dr. John S. Atwater, Atlanta, Georgia, read a paper entitled "The Relationship of Allergy to Gastro-Intestinal Disease" (Lantern Slides), which was discussed by Dr. Jerome S. Levy, Little Rock, Arkansas; Dr. Tim J. Manson, Chattanooga, Tennessee; and in closing by the essayist.

Dr. Gordon McHardy, New Orleans, Louisiana, read his Chairman's Address, entitled "The Gastroenterological Internist."

Paper by Dr. T. Dewey Davis and Dr. Samuel W. Budd, Jr., Richmond, Virginia, entitled "Gastric and Duodenal Diverticula" (Lantern Slides), was read by Dr. Davis, and was discussed by Dr. N. A. Kilgore, Houston, Texas; Dr. Benjamin G. Oren, Miami, Florida; and in closing by Dr. Davis.

Dr. Thomas T. Mackie, Winston-Salem, North Carolina, read a paper entitled "Amebiasis" (Lantern Slides), which was discussed by Dr. Walter Simrall Wyatt, Lexington, Kentucky; Dr. Gordon McHardy, New Orleans, Louisiana; Dr. James L. Borland, Jacksonville, Florida; Dr. Ryle A. Radke, (Lt. Col.) Fort Knox, Kentucky; and in closing by the essayist.

Paper by Dr. Frank Bone, Dr. George Baylin and Dr. Julian M. Ruffin, Durham, North Carolina, entitled "The Clinical Course of Ulcerative Colitis," was read by Dr. Bone, and was discussed by Dr. Frederick E. Marsh, Chattanooga, Tennessee; Dr. Carl W. Kumpe, Covington, Kentucky; and in closing by Dr. Bone.

The Section then adjourned until 2:00 p.m. Thursday.

Thursday, November 17, 2:00 p.m.

The Section met in the Netherland Plaza Hotel, Pavillon Caprice, Cincinnati, and was called to order by the Chairman, Dr. McHardy, who presided.

Paper by Dr. Milford O. Rouse and Dr. William S. Reynolds, Dallas, Texas, entitled "Tumors of the Small Intestine," was read by Dr. Rouse, and was discussed by Dr. William A. Altemeier, Cincinnati, Ohio; Dr. Gerard Raap, Miami, Florida; Dr. Gordon McHardy, New Orleans, Louisiana; and in closing by Dr. Rouse.

Paper by Dr. Eugene Cornatzer and Dr. David Cayer, Departments of Biochemistry and Internal Medicine, Bowman Gray School of Medicine, Winston-Salem, North Carolina, entitled "Phospholipid Synthesis in Hepatic Disease," was read by Dr. Cornatzer, and was discussed by Dr. Andrew C. Ivy, Chicago, Illinois; Dr. Jerome S. Levy, Little Rock, Arkansas; and in closing by Dr. Cayer.

Paper by Dr. James L. Borland and Dr. Charles E. Aucremann, Jacksonville, Florida, entitled "A Study of Patients After Gastrectomy," was read by Dr. Aucremann, and was discussed by Dr. H. Marvin Pollard, Ann Arbor, Michigan; Dr. Andrew C. Ivy, Chicago, Illinois; and in closing by Dr. Borland.

Dr. Andrew C. Ivy, Vice-President, University of Illinois, in charge of the Chicago Professional Colleges and Head of the Department of Clinical Science, Chicago, Illinois, read a paper entitled "The Physiological Analysis of the Psychosomatic Aspect of Peptic Ulcer."

Dr. Albert J. Sullivan, New Orleans, Louisiana, read a paper entitled "Some Psychosomatic Aspects of Gastroenterology" (Lantern Slides), which was discussed by Dr. John Tilden Howard, Baltimore, Maryland; Dr. Cecil O. Patterson, Dallas, Texas; Dr. Charles Baron, Covington, Kentucky; and in closing by the essayist.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Donald F. Marion, Miami, Florida.
Vice-Chairman—Dr. Jerome S. Levy, Little Rock, Arkansas.
Secretary—Dr. David Cayer, Winston-Salem, North Carolina.

The Section then adjourned *sine die*.

SECTION ON NEUROLOGY AND PSYCHIATRY

Officers

Chairman—Dr. James L. Anderson, Miami, Florida.
Secretary—Dr. Sullivan G. Bedell, Jacksonville, Florida.

Tuesday, November 15, 2:00 p.m.

The Section met in the Netherland Plaza Hotel, Parlors A-B-C-D, Cincinnati, and was called to order by the Secretary, Dr. Sullivan G. Bedell, Jacksonville, Florida.

The Chairman, Dr. James L. Anderson, Miami, Florida, read his Chairman's Address, entitled "Overprotection: Will It Mean the End of Civilization as We Know It?"

Dr. David I. Macht, Baltimore, Maryland, read a paper entitled "Phytopharmacological Reaction of Normal and Psychotic Blood Sera" (Lantern Slides), which was discussed by Dr. Walter O. Jahrreiss, Baltimore, Maryland; Dr. Louis A. Lourie, Cincinnati, Ohio; and in closing by the essayist.

Paper by Dr. James Asa Shield and Dr. Howard M. McCue, Jr., Richmond, Virginia, entitled "Experiences with Electro-Shock Therapy in Known Cardiovascular Disease" (Lantern Slides), was read by Dr. Shield and was discussed by Dr. David I. Macht, Baltimore, Maryland; Dr. Louis F. Bishop, Jr., New York, New York; Dr. A. Hauser, Houston, Texas; Dr. James L. Anderson, Miami, Florida; and in closing by Dr. McCue and Dr. Shield.

The Chairman appointed the following Nominating Committee: Dr. James Asa Shield, Chairman, Richmond, Virginia; Dr. Jack R. Jarvis, Birmingham, Alabama; and Dr. Geo. Wm. Murgatroyd, Baltimore, Maryland.

Dr. Lewis M. Helfer, San Antonio, Texas, read a paper entitled "Laminectomy Following Prolonged Cord Compression" (Lantern Slides), which was discussed by Dr. Edgar S. Lotspeich, Jr., Cincianati, Ohio; and Dr. James L. Anderson, Miami, Florida.

Dr. C. J. Ruilmann, Memphis, Tennessee, read a paper entitled "Investigation of Autonomic Responses in Psychopathic Personalities" (Lantern Slides), which was discussed by Dr. Lester W. Sontag, Yellow Springs, Ohio.

Dr. Leland B. Alford, St. Louis, Missouri, read a paper entitled "Localization of the Mental Functions: A New Conception" (Lantern Slides), which was discussed by Dr. Robert Dean Woolsey, St. Louis, Missouri; Dr. James L. Anderson, Miami, Florida; and in closing by the essayist.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. R. Burke Suitt, Durham, North Carolina.
Vice-Chairman—Dr. Ernest H. Alderman, Richmond, Virginia.
Secretary—Dr. Sullivan G. Bedell, Jacksonville, Florida.

The Section then adjourned *sine die*.

SECTION ON PEDIATRICS

Officers

Chairman—Dr. Samuel F. Ravenel, Greensboro, North Carolina.
Vice-Chairman—Dr. William L. Funkhouser, Atlanta, Georgia.
Secretary—Dr. James G. Hughes, Memphis, Tennessee.

Tuesday, November 15, 2:00 p.m.

The Section met in the Sinton Hotel, Ballroom, Cincinnati, and was called to order by the Chairman, Dr. Samuel F. Ravenel, Greensboro, North Carolina, who presided.

Paper by Dr. W. W. Waddell, Jr., and Dr. Armistead P. Booker, Charlottesville, Virginia, entitled "Observations on 484 Premature Infants Fed Mixtures of Cow's Milk," was read by Dr. Waddell, and was discussed by Dr. Lee J. Sutton, Jr., Richmond, Virginia.

Paper by Dr. William G. Crook, Jackson, Tennessee, and Dr. Horace L. Hodes and Dr. B. Reed Clanton, Baltimore, Maryland, entitled "Hemophilus Influenzae Meningitis: Observations on the Treatment of 110 Patients" (Lantern Slides), was read by Dr. Crook, and was discussed by Dr. J. Cyril Peterson, Nashville, Tennessee.

Dr. Samuel F. Ravenel, Greensboro, North Carolina, read his Chairman's Address, entitled "The Challenge of Rocky Mountain Spotted Fever" (Lantern Slides), which was discussed by Dr. William G. Crook, Jackson, Tennessee; Dr. J. Cyril Peterson, Nashville, Tennessee; and in closing by the essayist.

Paper by Dr. Chester P. Lynxwiler and Dr. C. Robert E. Wells, St. Louis, Missouri, entitled "Patent Ductus Arteriosus: A Preoperative and Postoperative Study of 180 Cases," was read by Dr. Lynxwiler.

Dr. Alston Callahan, Professor of Ophthalmology and Otolaryngology, The Medical College of Alabama, Birmingham, Alabama, read a paper entitled "The Surgery of Congenital Glaucoma" (Lantern Slides), which was discussed by Dr. J. Gay VanDermark, Covington, Kentucky.

Paper by Dr. Oscar B. Hunter, Jr., and Dr. John B. Ross, Washington, D. C., entitled "Studies on Newborn Children of Rh Sensitized Mothers" (Lantern Slides), was read by Dr. Hunter, and was discussed by Dr. D. Lesesne Smith, Spartanburg, South Carolina; and in closing by Dr. Hunter.

The Chairman appointed the following Nominating Committee: Dr. Harvey F. Garrison, Chairman, Jackson, Mississippi; Dr. Carroll M. Pounders, Oklahoma City, Oklahoma; and Dr. D. Lesesne Smith, Spartanburg, South Carolina.

The Section then adjourned until 2:00 p.m. Wednesday.

Wednesday, November 16, 2:00 p.m.

The Section met in the Sinton Hotel, Ballroom, Cincinnati, and was called to order by the Chairman, Dr. Ravenel, who presided.

Paper by Dr. Leonard J. Koenig, Dr. Thomas S. Weaver and Ada Childers (M.A.), Nashville, Tennessee, and Dr. Helen S. Woods, Rutland, Vermont, entitled "Rheumatic Fever in Tennessee" (Lantern Slides), was read by Dr. Weaver, and was discussed by Dr. C. Kermit Pitt, Decatur, Alabama; Dr. Robert A. Lyon, Cincinnati, Ohio; Dr. Harry M. Gilkey, Kansas City, Missouri; Dr. W. Ambrose McGee, Richmond, Virginia; Dr. Russell E. Kinsey, Williamstown, Kentucky; and in closing by Dr. Weaver.

Dr. J. R. Bowman, Johnson City, Tennessee, read a paper entitled "Medical Care in Major Pediatric Surgery" (Lantern Slides), which was discussed by Dr. Katharine Dodd, Cincinnati, Ohio; Dr. James G. Hughes, Memphis, Tennessee; and in closing by the essayist.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. William L. Funkhouser, Atlanta, Georgia.
Vice-Chairman—Dr. Coursen B. Conklin, Washington, D. C.
Secretary—Dr. James G. Hughes, Memphis, Tennessee.

Dr. A. Ashley Weech, B. K. Rachford Professor of Pediatrics, University of Cincinnati College of Medicine, Cincinnati, Ohio, read a paper entitled "Paving the Way for Accepting the Inevitable."

Paper by Dr. J. Cyril Peterson and Dr. Amos Christie, Nashville, Tennessee, entitled "Combined Immunizations in Early Infancy" (Lantern Slides), was read by Dr. Peterson, and was discussed by Dr. William Farris, Gallatin, Tennessee; Dr. Harry Andrews, Louisville, Kentucky; Dr. W. Ambrose McGee, Richmond, Virginia; and in closing by Dr. Peterson.

Paper by Dr. Joseph A. Little, Dr. Edsel Reed, Dr. Sanford Leikin and Dr. Herbert O. Kerman, University of Louisville School of Medicine, Louisville, Kentucky, entitled "Kerosene Pneumonia: A Critical Analysis of Twenty-Five Cases with Follow-Up Studies," was read by Dr. Reed, and was discussed by Dr. Frederic N. Silverman, Cincinnati, Ohio; Dr. James G. Hughes, Memphis, Tennessee; and in closing by Dr. Reed.

Dr. Carroll Crescent Lupton, Greensboro, North Carolina, read a paper entitled "The Surgical Repair of Congenital Funnel Breast" (Lantern Slides), which was discussed by Dr. J. R. Bowman, Johnson City, Tennessee; Dr. Samuel F. Ravenel, Greensboro, North Carolina; Dr. W. L. Rucks, Memphis, Tennessee; and in closing by the essayist.

The Section then adjourned *sine die*.

SECTION ON PATHOLOGY

Officers

Chairman—Dr. Russell L. Holman, New Orleans, Louisiana.
Vice-Chairman—Dr. H. R. Pratt-Thomas, Charleston, South Carolina.
Secretary—Dr. Cyrus C. Erickson, Durham, North Carolina.

Monday, November 14

The Section on Pathology of the Southern Medical Association met conjointly with the College of American Pathologists, Southeastern Section, Monday forenoon, and for a dinner meeting Monday evening (see page 372 for minutes of the College of American Pathologists, Southeastern Section).

Tuesday, November 15, 9:00 a.m.

The Section met in the Netherland Plaza Hotel, Pavillon Caprice, Cincinnati, and was called to order by the Chairman, Dr. Russell L. Holman, Professor of Pathology, Louisiana State University School of Medicine, New Orleans, Louisiana, who read his Chairman's Address, entitled "Era of Expansion in Pathology."

Dr. Hans F. Smetana, Chief of Pathology, Armed Forces Institute of Pathology, Washington, D. C., read a paper entitled "Sclerosing Lipogranuloma" (Lantern Slides), which was discussed by Dr. R. H. Rigdon, Galveston, Texas; Dr. Paul Kimmelstiel, Charlotte, North Carolina; Dr. Jacob Furth, Oak Ridge, Tennessee; Dr. Wiley D. Forbus, Durham, North Carolina; and in closing by the essayist.

Dr. Raymond O. Dart, Brigadier General, U. S. Army, and Director, Armed Forces Institute of Pathology, Washington, D. C., read a paper entitled "The Relationship of the Armed Forces Institute of Pathology to the American Pathologist" (Lantern Slides).

The Chairman appointed the following Nominating Committee: Dr. E. S. Maxwell, Chairman, Lexington, Kentucky; Dr. Everett L. Bishop, Atlanta, Georgia; and Dr. Douglas H. Sprunt, Memphis, Tennessee.

Dr. Elbert DeCoursey, Colonel, Medical Corps, Commandant, Army Medical Department, Research and Graduate School, Washington, D. C., read a paper entitled "Effects of Nuclear Explosion on the Reticulo-Endothelial System" (Lantern Slides), which was discussed by Dr. Jacob Furth, Oak Ridge, Tennessee; and in closing by the essayist.

Dr. George Z. Williams, Director, Department of Oncology, Medical College of Virginia, Richmond, Virginia, read a paper entitled "The Distribution of Radioactive Gold Colloid in Rats, Mice, and Transplanted Mouse Tumors" (Lantern Slides), which was discussed by Dr. R. H. Rigdon, Galveston, Texas; Dr. Jacob Furth, Oak Ridge, Tennessee; and in closing by the essayist.

Paper by Dr. E. R. Pund, Professor of Pathology, and Dr. H. E. Nieburgs, Departments of Pathology and Oncology, University of Georgia School of Medicine, Augusta, Georgia, was read by Dr. Nieburgs, and was discussed by Dr. Bayard Carter, Durham, North Carolina; Dr. Leland Stoddard, Durham, North Carolina; and in closing by Dr. Nieburgs.

Paper by Dr. L. V. McVay, Dr. R. L. Laird and Dr. Douglas H. Sprunt, University of Tennessee College of Medicine, Memphis, Tennessee, entitled "Evaluation of the Use of Aureomycin in the Treatment of Amebiasis" (Lantern Slides), was read by Dr. McVay, and was discussed by Dr. Donald S. Martin, Durham, North Carolina; and in closing by Dr. Sprunt and Dr. McVay.

It was the consensus of opinion that the group would be in favor of holding two half-day sessions, preferably with the College of American Pathologists, Southeastern Section, at next year's convention.

The Nominating Committee reported the following nominations for the Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Cyrus C. Erickson, Durham, North Carolina.
Vice-Chairman—Dr. J. F. A. McManus, Birmingham, Alabama.
Secretary—Dr. H. R. Pratt-Thomas, Charleston, South Carolina.

The Section then adjourned *sine die*.

SECTION ON RADIOLOGY

Officers

Chairman—Dr. Wendell G. Scott, St. Louis, Missouri.
Vice-Chairman—Dr. Robert C. Pendergrass, Americus, Georgia.
Secretary—Dr. Gerard Raap, Miami, Florida.

Wednesday, November 16, 2:00 p.m.

The Section met in the Netherland Plaza Hotel, Parlors A-B-C-D, Cincinnati, and was called to order by the Chairman, Dr. Wendell G. Scott, St. Louis, Missouri, who read his Chairman's Address, entitled "Cerebral Angiography with the Rapidograph."

The Chairman appointed the following Nominating Committee: Dr. Jesshill Love, Chairman, Louisville, Kentucky; Dr. Edwin C. Ernst, St. Louis, Missouri; and Dr. Chas. McC. Gray, Tampa, Florida.

Paper by Dr. John F. Roach, Dr. Robert D. Sloan and Dr. Russell H. Morgan, Baltimore, Maryland, entitled "The Early Detection of Gastric Carcinoma by Photofluorographic Methods" (Lantern Slides), was read by Dr. Sloan, and was discussed by Dr. Robert J. Reeves, Durham, North Carolina; Dr. Vincent W. Archer, Charlottesville, Virginia; and in closing by Dr. Sloan.

Dr. H. Dabney Kerr, Professor of Radiology, Iowa Medical School, University of Iowa, Iowa City, Iowa, read a paper entitled "The Place of Radiation in the Care of Diseases of the Nervous System."

Paper by Dr. Joseph C. Bell, Dr. James B. Douglas and Dr. G. M. Peterson, Louisville, Kentucky, entitled "Some of the Less Common Lesions of the Esophagus" (Lantern Slides), was read by Dr. Douglas, and was discussed by Dr. D. B. Harding, Lexington, Kentucky; and in closing by Dr. Douglas.

Paper by Dr. John Day Peake and Dr. Marshall Eskridge, Mobile, Alabama, entitled 'Hepatic Amebiasis with Complications" (Lantern Slides), was read by Dr. Peake, and was discussed by Dr. David Shapiro, Louisville, Kentucky; Dr. Robert J. Reeves, Durham, North Carolina; and in closing by Dr. Peake.

Paper by Dr. William M. Kitchen and Dr. Everett R. Deweese, Kansas City, Missouri, entitled "Radiographic Diagnosis of Polypoid Lesions of the Digestive Tract" (Lantern Slides), was read by Dr. Kitchen, and was discussed by Dr. Robert D. Moreton, Temple, Texas; and in closing by Dr. Kitchen.

Paper by Dr. Vincent W. Archer, Dr. George Cooper, Jr., Dr. Herbert D. Hebel, Dr. John G. Kroll and Dr. D. A. Cunningham, University, Virginia, entitled "Lead Glass Fabric," (Lantern Slides), was read by Dr. Archer.

The Nominating Committee reported the following nominations

for the Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Gerard Raap, Miami, Florida.
Vice-Chairman—Dr. Joseph C. Bell, Louisville, Kentucky.
Secretary—Dr. Robert C. Pendergrass, Americus, Georgia.

The Section then adjourned *sine die*.

SECTION ON DERMATOLOGY AND SYPHILOLOGY

Officers

Chairman—Dr. Richard W. Fowlkes, Richmond, Virginia.
Vice-Chairman—Dr. William L. Dobes, Atlanta, Georgia.
Secretary—Dr. D. Truett Gandy, Houston, Texas.

Wednesday, November 16, 9:00 a.m.

The Section met in the Gibson Hotel, Roof Garden Room, Cincinnati, and was called to order by the Chairman, Dr. Richard W. Fowlkes, Richmond, Virginia, who read by title his Chairman's Address, entitled "Office Management of Neurodermatitis."

Dr. Sven Hellerstrom, Stockholm, Sweden, read a paper entitled "Erythema Chronicum Migrans (Afzelius) with Meningitis" (Lantern Slides), which was discussed by Dr. Samuel Goldblatt, Cincinnati, Ohio; Dr. Everett S. Lain, Oklahoma City, Oklahoma; Dr. Karl G. Zwick, Cincinnati, Ohio; and in closing by the essayist.

Dr. Ashton L. Welsh, Assistant Professor of Dermatology and Syphilology, University of Cincinnati College of Medicine, Cincinnati, Ohio, read a paper entitled "Differential Diagnosis of Precancerous and Cancerous Lesions of the Mouth" (Lantern Slides).

Dr. J. B. Howell, Dallas, Texas, read a paper entitled "Cancer of the Center Face: Treatment with Radium Needles" (Lantern Slides), which was discussed by Dr. Howard Hailey, Atlanta, Georgia; and Dr. Dudley C. Smith, Charlottesville, Virginia.

Paper by Dr. C. Barrett Kennedy, Dr. V. Medd Henington, Dr. Raphael Ross, Jr., and Dr. Ralph M. Hartwell, New Orleans, Louisiana, entitled "Geriatric Dermatology" (Lantern Slides), was read by Dr. Kennedy, and was discussed by Dr. Hugh E. Hailey, Atlanta, Georgia; and Dr. Raymond C. V. Robinson, Baltimore, Maryland.

Paper by Dr. J. Lamar Callaway, Dr. Victor R. Hirschmann, Dr. Arthur H. Flower, Jr., and Dr. Sidney Olansky, Durham, North Carolina, entitled "A Four-Year Study of Penicillin Treatment of Syphilis of the Central Nervous System," was read by Dr. Callaway, and was discussed by Dr. Adolph B. Loveman, Louisville, Kentucky; Dr. E. R. Hall, Memphis, Tennessee; Dr. Harry M. Robinson, Jr., Baltimore, Maryland; Dr. Harry M. Robinson, Sr., Baltimore, Maryland; and in closing by Dr. Callaway.

Dr. Carey C. Barrett, Lexington, Kentucky, read a paper entitled "Endemic Favus" (Lantern Slides), which was discussed by Dr. H. Ford Anderson, Washington, D. C.; Dr. William L. Dobes, Atlanta, Georgia; Dr. Leon Goldman, Cincinnati, Ohio; Dr. Morris Moore, St. Louis, Missouri; and in closing by the essayist.

The Chairman appointed the following Nominating Committee: Dr. James W. Anderson, Chairman, Norfolk, Virginia; Dr. Ray O. Noojin, Birmingham, Alabama; and Dr. J. B. Howell, Dallas, Texas.

The Section then adjourned until 9:00 a.m. Thursday.

Thursday, November 17, 9:00 a.m.

The Section met in the Gibson Hotel, Roof Garden Room, Cincinnati, and was called to order by the Chairman, Dr. Fowlkes, who presided.

Dr. James Kirby Howles, New Orleans, Louisiana, read a paper entitled "Sarcoidosis in the Negro" (Lantern Slides), which was discussed by Dr. Ray O. Noojin, Birmingham, Alabama; Dr. J. Howard King, Nashville, Tennessee; Dr. Lawrence Goldberg, Cincinnati, Ohio; Dr. J. Lamar Callaway, Durham, North Carolina; Dr. Leslie M. Smith, El Paso, Texas; Dr. Francis A. Ellis, Baltimore, Maryland; and in closing by the essayist.

Paper by Dr. Thos. W. Murrell, Jr., and Dr. Thos. W. Murrell, Richmond, Virginia, entitled "Urticaria with Cerebral Edema," was read by Dr. Murrell, Jr., and was discussed by Dr. Clinton W. Lane, St. Louis, Missouri; Dr. Everett S. Lain, Oklahoma City, Oklahoma; Dr. Leon Goldman, Cincinnati, Ohio; Dr. M. C. Barnes, Waco, Texas; Dr. Robert Brandt, Cincinnati, Ohio; Dr. Alan D. Brown, Jacksonville, Florida; and in closing by Dr. Murrell, Jr.

Paper by Dr. Leslie M. Smith and Dr. H. D. Garrett, El Paso, Texas, entitled "Multiple Superficial Epitheliomatosis, with Special Reference to Treatment with Podophyllin" (Lantern Slides), was read by Dr. Smith, and was discussed by Dr. Maurice C. Barnes, Waco, Texas; Dr. D. Truett Gandy, Houston, Texas; Dr. Francis A. Ellis, Baltimore, Maryland; Dr. Everett S. Lain, Oklahoma City, Oklahoma; Dr. Roy L. Kile, Cincinnati, Ohio; Dr. Clinton W. Lane, St. Louis, Missouri; Dr. Leon Goldman, Cincinnati, Ohio; and in closing by Dr. Smith.

Dr. A. H. Conrad, Jr., St. Louis, Missouri, read a paper entitled "Gastroscopic Findings in Acne Rosacea" (Lantern Slides), which was discussed by Dr. Bruce Kenamore, St. Louis, Missouri; Dr. Everett S. Lain, Oklahoma City, Oklahoma; Dr. Howard Hailey, Atlanta, Georgia; and in closing by the essayist.

Dr. Phyllis Emmaline Jones, Oklahoma City, Oklahoma, read a paper entitled "Panniculitus, with Report of Cases" (Lantern Slides), which was discussed by Dr. Leon Goldman, Cincinnati, Ohio; Dr. C. A. Andrews, Tampa, Florida; and in closing by the essayist.

Dr. Eugene S. Bereston, Baltimore, Maryland, read a paper entitled "Further Studies on Aspergillus Infections of the Nails" (Lantern Slides), which was discussed by Dr. Morris Moore, St. Louis, Missouri; Dr. Howard Hailey, Atlanta, Georgia; and in closing by the essayist.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Wiley M. Sams, Miami, Florida.
Vice-Chairman—Dr. J. Lamar Callaway, Durham, North Carolina.
Secretary—Dr. D. Truett Gandy, Houston, Texas.

The Section then adjourned *sine die*.

SECTION ON ALLERGY

Officers

Chairman—Dr. W. Ambrose McGee, Richmond, Virginia.
Vice-Chairman—Dr. Mason I. Lowance, Atlanta, Georgia.
Secretary—Dr. Vincent J. Derbes, New Orleans, Louisiana.

Tuesday, November 15, 2:00 p.m.

The Section met in the Netherland Plaza Hotel, Pavillon Caprice, Cincinnati, and was called to order by the Chairman, Dr. W. Ambrose McGee, Richmond, Virginia, who presided.

The Chairman appointed the following Nominating Committee: Dr. I. S. Kahn, Chairman, San Antonio, Texas; Dr. Armand E. Cohen, Louisville, Kentucky; and Dr. W. Ambrose McGee, Richmond, Virginia.

Dr. George Piness, Associate Professor of Clinical Medicine, University of Southern California School of Medicine, and Chief of Allergy, Children's Hospital and Good Hope Hospital, Los Angeles, California, read a paper entitled "Allergic Bronchial Pneumonia," which was discussed by Dr. Howard L. Stitt, Cincinnati, Ohio; Dr. Julian P. Howell, Selma, Alabama; and in closing by the essayist.

Dr. W. Ambrose McGee, Richmond, Virginia, read his Chairman's Address, entitled "Colic: Its Pattern in Infancy and Later Life."

Paper by Dr. Louis Cullick and Dr. Henry D. Ogden, New Orleans, Louisiana, entitled "Clinical Studies of Chlorcyclizine," was read by Dr. Cullick, and was discussed by Dr. S. H. Jaros, Tuckahoe, New York.

Dr. J. W. H. Rouse, San Antonio, Texas, read a paper entitled "Treatment Severe Penicillin and Other Drug Reactions," which was discussed by Dr. I. S. Kahn, San Antonio, Texas; Dr. George Piness, Los Angeles, California; Dr. S. William Simon, Dayton, Ohio; Dr. Geo. E. Rockwell, Milford, Ohio; Dr. Armand E. Cohen, Louisville, Kentucky; and in closing by the essayist.

Paper by Dr. Vincent J. Derbes and Dr. Foster U. Martin, New Orleans, Louisiana, entitled "The Effects of Acetaldehyde on Perfused Lungs and Coronary Vessels" (Lantern Slides), was read by Dr. Derbes, and was discussed by Dr. William D. Davis, Jr., New Orleans, Louisiana.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Mason I. Lowance, Atlanta, Georgia.
Vice-Chairman—Dr. Alan G. Cazort, Little Rock, Arkansas.
Secretary—Dr. Vincent J. Derbes, New Orleans, Louisiana.

The Section then adjourned *sine die*.

SECTION ON PHYSICAL MEDICINE

Officers

Chairman—Dr. George D. Wilson, Asheville, North Carolina.
Vice-Chairman—Dr. Walter J. Lee, Richmond, Virginia.
Secretary—Dr. E. M. Smith, Washington, D. C.

Tuesday, November 15, 2:00 p.m.

The Section met in the Gibson Hotel, Victory Room, Cincinnati, and was called to order by the Vice-Chairman, Dr. Walter J. Lee, Richmond, Virginia, who presided for the Chairman for a part of the session.

Dr. George D. Wilson, Asheville, North Carolina, read his Chairman's Address, entitled "Power Exercises in Medicine" (Lantern Slides).

The Chairman appointed the following Nominating Committee: Dr. Walter J. Lee, Chairman, Richmond, Virginia; Dr. George D. Wilson, Asheville, North Carolina; and Dr. E. M. Smith, Washington, D. C.

Dr. Donald A. Covalt, New York University Bellevue Medical Center, Institute of Rehabilitation and Physical Medicine, New York, New York, read a paper entitled "Rehabilitation of the Hemiplegic Patient" (Lantern Slides), which was discussed by Dr. Walter J. Lee, Richmond, Virginia; Dr. A. Ray Dawson, Richmond, Virginia; and Dr. E. M. Smith, Washington, D. C.

Dr. Robert J. Murphy, Columbus, Ohio, presented the subject "Physical Medicine in Peripheral Nerve Injuries" (Lantern Slides), which was discussed by Dr. George D. Wilson, Asheville, North Carolina.

Dr. Gordon M. Martin, Assistant Professor of Physical Medicine, Mayo Foundation, and Consultant, Physical Medicine, Mayo Clinic, Rochester, Minnesota, read a paper entitled "Medical Possibilities of Microwave Diathermy" (Lantern Slides).

Dr. John C. Burch, Department of Obstetrics and Gynecology, Vanderbilt University School of Medicine, Nashville, Tennessee, read a paper entitled "Early Ambulation in Surgery," which was discussed by Dr. Sam Foster Seeley, Washington, D. C.; and Dr. F. E. Dugdale, Fort Thomas, Kentucky.

Dr. James R. Garner, Atlanta, Georgia, read a paper entitled "Practical Suggestions for Improvement of Posture," which was discussed by Dr. Ferdinand F. Schwartz, Birmingham, Alabama.

A resolution changing the name of the section to Section on Physical Medicine and Rehabilitation was voted upon and unanimously carried.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Walter J. Lee, Richmond, Virginia.
Vice-Chairman—Dr. E. M. Smith, Washington, D. C.
Secretary—Dr. A. Ray Dawson, Richmond, Virginia.

The Section then adjourned *sine die*.

SECTION ON INDUSTRIAL MEDICINE AND SURGERY

Officers

Chairman—Dr. Carl A. Nau, Galveston, Texas.
Vice-Chairman—Dr. Gradie R. Rowntree, Louisville, Kentucky.
Secretary—Dr. J. J. Brandabur, Huntington, West Virginia.

Thursday, November 17, 2:00 p.m.

The Section met in the Gibson Hotel, Ballroom, Cincinnati, and was called to order by the Chairman, Dr. Carl A. Nau, Galveston, Texas, who presided.

The Chairman appointed the following Nominating Committee: Dr. J. J. Brandabur, Chairman, Huntington, West Virginia; Dr. Wm. H. Rice, Ashland, Kentucky; and Dr. Walter E. Fleischer, Baltimore, Maryland.

Dr. Kieffer D. Davis, Medical Director, Phillips Petroleum Company, Bartlesville, Oklahoma, read a paper entitled "A New Concept for Periodic Examinations of Field Employees of Petroleum Industries" (Lantern Slides), which was discussed by Dr. Walter E. Fleischer, Baltimore, Maryland; Dr. R. Lomax Wells, Washington, D. C.; and Dr. John S. Phair, Cincinnati, Ohio; and in closing by the essayist.

Dr. R. Lomax Wells, Medical Director, Chesapeake and Potomac Telephone Companies, Washington, D. C., read a paper entitled "Variables in Industrial Absenteeism" (Lantern Slides), which was discussed by Dr. Robert A. Kehoe, Cincinnati, Ohio; and in closing by the essayist.

Dr. Julian E. Williams, Medical Director, Tennessee Eastman Corporation, Kingsport, Tennessee, read a paper entitled "Hazards Associated with Chemical Manufacturing" (Lantern Slides), which was discussed by Dr. Walter E. Fleischer, Baltimore, Maryland; and Dr. Robert A. Kehoe, Cincinnati, Ohio; and in closing by the essayist.

Dr. W. C. Hueper, Environmental Cancer Section, Cancer Control Branch, U. S. Public Health Service, National Institutes of Health, Bethesda, Maryland, read a paper entitled "Present and Potential Occupational Carcinogens and Carcinogenic Operations in Modern Industry" (Lantern Slides), which was discussed by Dr. Leon Goldman, Cincinnati, Ohio; and in closing by the essayist.

Dr. William H. Rice, Chief Surgeon, Armco Steel Corporation, Ashland Division, Ashland, Kentucky, read a paper entitled "Management of Diseases of the Heart in the Steel Industry."

Paper by Dr. Truman G. Blocker, Professor of Plastic and Maxillofacial Surgery, and Dr. Clifford Snyder, Resident Physician in Plastic Surgery, University of Texas Medical Branch, Galveston, Texas, entitled "Injuries of the Lower Extremities and Their Significance in Industry," was read by Dr. Snyder, and was discussed by Dr. Lee B. Grant, Cincinnati, Ohio; and in closing by Dr. Snyder.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Gradie R. Rowntree, Louisville, Kentucky.
Vice-Chairman—Dr. Kieffer D. Davis, Bartlesville, Oklahoma.
Secretary—Dr. J. J. Brandabur, Huntington, West Virginia.

The Section then adjourned *sine die*.

SECTION ON SURGERY

Officers

Chairman—Dr. Joseph S. Stewart, Miami, Florida.
Vice-Chairman—Dr. David Henry Poer, Atlanta, Georgia.
Secretary—Dr. James M. Mason, III, Birmingham, Alabama.

Wednesday, November 16, 9:00 a.m.

The Section met in the Netherland Plaza Hotel, Hall of Mirrors, Cincinnati, and was called to order by the Chairman of the Section, Dr. Joseph S. Stewart, Miami, Florida, who presided.

The Chairman appointed the following Nominating Committee: Dr. R. W. Wilkinson, Chairman, Huntington, West Virginia; Dr. R. L. Sanders, Memphis, Tennessee; and Dr. Walter C. Jones, Miami, Florida.

Paper by Dr. H. Max Schiebel and Dr. William H. Freeman, Durham, North Carolina, entitled "The Treatment of Inguinal Hernia in Infants and Children" (Lantern Slides), was read by Dr. Schiebel, and was discussed by Dr. Clarence E. Gardner, Durham, North Carolina; Dr. Richard Van Fletcher, Chattanooga, Tennessee; Dr. Frank K. Boland, Atlanta, Georgia; and in closing by Dr. Schiebel.

Dr. Leslie V. Rush, Meridian, Mississippi, read a paper entitled "The Rationale of Medullary Fixation of Fractures" (Lantern Slides), which was discussed by Dr. Walter G. Stuck, San Antonio, Texas; Dr. Dana M. Street, Memphis, Tennessee; and in closing by Dr Rush.

Dr. Robert F. Guthrie, Birmingham, Alabama, read a paper entitled "Acute Free Perforations of the Gallbladder" (Lantern Slides), which was discussed by Dr. V. Duncan Shepard, Atlanta, Georgia; Dr. John W. Turner, Atlanta, Georgia; Dr. James M. Mason, III, Birmingham, Alabama; Dr. David Henry Poer, Atlanta, Georgia; and in closing by the essayist.

Dr. Osler Abbott, Assistant Professor of Surgery, Emory University School of Medicine, Atlanta, Georgia, read a paper entitled "Surgical Aspects of Bilateral Bronchiectasis" (Lantern Slides).

Dr. Ernest T. Trice, Richmond, Virginia, read a paper entitled "Early Ambulation as an Aid in Postoperative Management" (Lantern Slides), which was discussed by Dr. Daniel J. Leithauser, Detroit, Michigan; Dr. Earle E. Shouldice, Toronto, Canada; and in closing by the essayist.

Dr. Arthur Purdy Stout, Professor of Surgery, Columbia University, and Attending Surgical Pathologist, Presbyterian Hospital, New York, New York, read a paper entitled "The Role of Pathology in Lesions of the Breast" (Lantern Slides).

The Section then adjourned until 9:00 a.m. Thursday.

Thursday, November 17, 9:00 a.m.

The Section met in the Netherland Plaza Hotel, Hall of Mirrors, Cincinnati, and was called to order by the Chairman, Dr. Stewart, who presided.

Dr. Claude J. Hunt, Kansas City, Missouri, read a paper entitled "Clinical Manifestations and Radiological Indications of Small Bowel Obstruction" (Lantern Slides), which was discussed by Dr. R. L. Sanders, Memphis, Tennessee; Dr. Walter C. Jones, Miami, Florida; and in closing by the essayist.

Paper by Dr. James W. Hendrick, Dr. Grant E. Ward and Dr. Robert G. Chambers, Baltimore, Maryland, entitled "Diagnosis and Treatment of Carcinoma of the Thyroid Gland" (Lantern Slides), was read by Dr. Hendrick, and was discussed by Dr. William F. Rienhoff, Jr., Baltimore, Maryland; Dr. Sam Foster Seeley, Washington, D. C.; and in closing by Dr. Hendrick.

The Chairman of the Section expressed concern over the very small attendance at meetings of the Section. Dr. R. L. Sanders, Memphis, Tennessee, advised the Section that he had been appointed chairman of a committee by the Council to look into the matter of attendance at Section meetings, and he asked for written suggestions from the members as to the possibility of combining of the Sections or other means for increasing attendance.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. David Henry Poer, Atlanta, Georgia.
Vice-Chairman—Dr. Thos. Kerr Laird, Montgomery, West Virginia.
Secretary—Dr. James M. Mason, III, Birmingham, Alabama.

Dr. William F. Rienhoff, Jr., Baltimore, Maryland, read a paper entitled "Surgical Treatment of Hyperparathyroidism" (Lantern Slides).

Dr. Thomas H. Burford, St. Louis, Missouri, read a paper entitled "Diagnosis and Management of Chest Tumors" (Lantern Slides), which was discussed by Dr. William F. Rienhoff, Jr., Baltimore, Maryland; and in closing by the essayist.

Paper by Dr. Keith S. Grimson, Dr. T. R. Broadbent, Dr. C. Keith Lyons, Dr. Charles E. Kernodle and Dr. Robert J. Reeves, Durham, North Carolina, entitled "Complications after Treatment of Achalasia by Esophagogastrostomy and Observations Following Supplementary Use of Vagotomy and Gastroenterostomy" (Lantern Slides), was read by Dr. Grimson, and was discussed by Dr. James M. Mason, III, Birmingham, Alabama; Dr. Sam Foster Seeley, Washington, D. C.; and in closing by Dr. Grimson.

Dr. Champ Lyons, New Orleans, Louisiana, read a paper entitled "Segmental Esophagectomy in Infants," which was discussed by Dr. James M. Mason, III, Birmingham, Alabama, and Dr. William F. Rienhoff, Jr., Baltimore, Maryland.

The Section then adjourned *sine die*.

SECTION ON ORTHOPEDIC AND TRAUMATIC SURGERY

Officers

Chairman—Dr. William M. Roberts, Gastonia, North Carolina.
Vice-Chairman—Dr. C. E. Irwin, Warm Springs, Georgia.
Secretary—Dr. Rufus H. Alldredge, New Orleans, Louisiana.

Tuesday, November 15, 9:00 a.m.

The Section met in the Gibson Hotel, Ballroom, Cincinnati, and was called to order by the Chairman, Dr. William M. Roberts, Gastonia, North Carolina, who presided.

The Chairman appointed the following Nominating Committee: Dr. Lenox D. Baker, Chairman, Durham, North Carolina; Dr. Walter G. Stuck, San Antonio, Texas; and Dr. W. K. West, Oklahoma City, Oklahoma.

Dr. Herbert W. Virgin, Jr., Miami, Florida, read a paper entitled "Diagnostic Studies in 350 Knee Injuries" (Lantern Slides), which was discussed by Dr. Moore Moore, Jr., Memphis, Tennessee; and in closing by the essayist.

Paper by Dr. Richard T. Odell, Dr. Robert H. Ramsey and Dr. J. Albert Key, St. Louis, Missouri, entitled "End Results after Operative Removal of Intervertebral Discs" (Lantern Slides), was read by Dr. Odell, and was discussed by Dr. Lenox D. Baker, Durham, North Carolina; Dr. William M. Roberts, Gastonia, North Carolina; Dr. R. J. W. Hobbs, Birmingham, Alabama; Dr. Herbert W. Virgin, Jr., Miami, Florida; Dr. J. A. Freiberg, Cincinnati, Ohio; Dr. A. R. Lutz, Parkersburg, West Virginia; Dr. R. O. Joplin, Louisville, Kentucky; Dr. Rufus H. Alldredge, New Orleans, Louisiana; and in closing by Dr. Key.

Dr. J. Neill Garber, Instructor in Orthopedic Surgery, University of Indiana Medical Center, Indianapolis, Indiana, read a paper entitled "Operative Treatment of Fractures of the Patella" (Lantern Slides and Motion Pictures).

Dr. William M. Roberts, Gastonia, North Carolina, read his Chairman's Address, entitled "End Result Studies in the Treatment of Congenital Coxa Vara" (Lantern Slides).

Paper by Dr. J. Warren White, Greenville, South Carolina, and Dr. Walter A. Hoyt, Akron, Ohio, entitled "A New and Simpler Technic for Ankle Fusion" (Lantern Slides), was read by Dr. Hoyt, and was discussed by Dr. Peter B. Wright, Augusta, Georgia; Dr. Lenox D. Baker, Durham, North Carolina; Dr. J. Albert Key, St. Louis, Missouri; Dr. H. R. McCarroll, St. Louis, Missouri; Dr. Ira H. Rapp, Charlotte, North Carolina; and in closing by Dr. Hoyt.

Paper by Dr. Marcus J. Stewart, Memphis, Tennessee, and Dr. Herbert A. Hamel, Kansas City, Missouri, entitled "Solitary Bone Cyst with Special Reference to Treatment" (Lantern Slides), was read by Dr. Stewart, and was discussed by Dr. Rufus H. Alldredge, New Orleans, Louisiana; Dr. J. Albert Key, St. Louis, Missouri; Dr. W. K. West, Oklahoma City, Oklahoma; Dr. H. R. McCarroll, St. Louis, Missouri; Dr. R. L. Anderson, Charleston, West Virginia; and in closing by Dr. Stewart.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Charles E. Irwin, Warm Springs, Georgia.
Vice-Chairman—Dr. Howard A. Swart, Charleston, West Virginia.
Secretary—Dr. Rufus H. Alldredge, New Orleans, Louisiana.

After discussion of unsatisfactory meeting conditions created through the Association's having twenty-one sections, it was moved and the motion put to a vote and carried that the Section is willing to combine with the Section on Industrial Medicine and Surgery and the Section on Physical Medicine and Rehabilitation, and that three half days be requested.

The Section then adjourned *sine die*.

SECTION ON OBSTETRICS

Officers

Chairman—Dr. Woodard D. Beacham, New Orleans, Louisiana.
Vice-Chairman—Dr. Williamson Z. Bradford, Charlotte, North Carolina.
Secretary—Dr. Hugh G. Hamilton, Kansas City, Missouri.

Wednesday, November 16, 9:00 a.m.

The Section met in the Gibson Hotel, Victory Room, Cincinnati, and was called to order by the Chairman, Dr. Woodard D. Beacham, New Orleans, Louisiana, who presided.

The Chairman appointed the following Nominating Committee: Dr. E. Lee Dorsett, St. Louis, Missouri, Chairman; Dr. Bayard Carter, Durham, North Carolina; and Dr. William T. Black, Memphis, Tennessee.

Paper by Dr. Simon V. Ward and Dr. Thomas Benton Sellers, New Orleans, Louisiana, entitled "Controversial Issues in Handling Breech Presentation," was read by Dr. Ward, and was discussed by Dr. Waverly R. Payne, Newport News, Virginia; Dr. E. Lee Dorsett, St. Louis, Missouri; Dr. Henry J. Langston, Danville, Virginia; and in closing by Dr. Ward.

Paper by Dr. W. O. Johnson and Dr. J. B. Marshall, Louisville, Kentucky, entitled "Pregnancy Following Sterility" (Lantern Slides), was read by Dr. Marshall, and was discussed by Dr. William Bickers, Richmond, Virginia; and in closing by Dr. Marshall.

Dr. Eva F. Dodge, Little Rock, Arkansas, read a paper entitled "The Young Primigravida," which was discussed by Dr. Andrew A. Marchetti, Washington, D. C.; Dr. J. Morris Reese, Baltimore, Maryland; and in closing by the essayist.

Dr. John Parks, Professor of Obstetrics and Gynecology, George Washington University School of Medicine, Washington, D. C., read a paper entitled "The Diagnosis and Treatment of Placenta Previa" (Lantern Slides), which was discussed by Dr. Frank R. Lock, Winston-Salem, North Carolina; Dr. Curtis J. Lund, New Orleans, Louisiana; and in closing by the essayist.

Dr. Walter A. Ruch, Memphis, Tennessee, read a paper entitled "A Comparison of 'Rooming-In' Versus Standard Nursery Technic," which was discussed by Dr. John Parks, Washington, D. C.; Dr. Bayard Carter, Durham, North Carolina; and in closing by the essayist.

Dr. Oren Moore, Charlotte, North Carolina, read a paper entitled "Pulmonary Embolism of Amniotic Fluid Origin" (Lantern Slides),

which was discussed by Dr. Thomas Benton Sellers, New Orleans, Louisiana; and Dr. Bayard Carter, Durham, North Carolina.

The Section then adjourned until 9:00 a.m. Thursday.

Thursday, November 17, 9:00 a.m.

The Section met in the Gibson Hotel, Victory Room, Cincinnati, and was called to order by the Chairman, Dr. Beacham, who presided.

Dr. Garth L. Jarvis, Galveston, Texas, read a paper entitled "The Practice Significance of the Rh Factor," which was discussed by Dr. H. Hudnall Ware, Richmond, Virginia; Dr. Silas H. Starr, Louisville, Kentucky; Dr. Charles Baron, Covington, Kentucky; Dr. Chester D. Bradley, Newport News, Virginia; and in closing by the essayist.

Paper by Dr. R. N. Creadick, Dr. R. A. Ross, Dr. W. L. Thomas and Dr. Bayard Carter, Department of Obstetrics and Gynecology, Duke University School of Medicine, Durham, North Carolina, entitled "Indications for Cesarean Section," was read by Dr. Creadick, and was discussed by Dr. J. Randolph Perdue, Miami, Florida; Dr. Willis E. Brown, Little Rock, Arkansas; and in closing by Dr. Creadick.

Due to illness the paper by Dr. Carl P. Huber, Professor and Chairman of Department of Obstetrics and Gynecology, Indiana University School of Medicine, Indianapolis, Indiana, entitled "The Obstetric Problem of Prematurity" (Lantern Slides), was not presented.

Paper by Dr. Herman W. Johnson and Dr. Joseph I. Spezia, Houston, Texas, entitled "A Conservative Termination of Pregnancy Versus Cesarean Section in Severe Preeclampsia and Eclampsia" (Lantern Slides), was read by Dr. Johnson, and was discussed by Dr. C. H. Mauzy, Winston-Salem, North Carolina; Dr. Leo J. Hartnett, St. Louis, Missouri; and Dr. J. Hofbauer, Cincinnati, Ohio; and in closing by Dr. Johnson.

Paper by Dr. Leo J. Hartnett, Senior Instructor in Department of Gynecology and Obstetrics, and Dr. H. J. Freiheit, Instructor in Department of Anaesthesiology, St. Louis University School of Medicine, St. Louis, Missouri, entitled "Curare as an Adjunct in the Conduct of Labor: A Preliminary Report of the Results in Approximately 200 Deliveries" (Lantern Slides), was read by Dr. Hartnett, and was discussed by Dr. Willis E. Brown, Little Rock, Arkansas; Dr. Samuel M. Dodek, Washington, D. C.; Dr. Howard Katzman, Washington, D. C.; Dr. Ralph M. S. Barrett, Clayton, Missouri; Dr. Hugh Hamilton, Kansas City, Missouri; and in closing by Dr. Hartnett

Dr. Woodard D. Beacham, New Orleans, Louisiana, read his Chairman's Address, entitled "Sickle Cell Disease and Pregnancy" (Lantern Slides).

The following resolution was presented and adopted unanimously:

WHEREAS, in the last thirty years the specialties of obstetrics and gynecology have developed in breadth and scope so as to now embrace approximately thirty per cent of the entire practice of medicine.

THEREFORE, be it hereby resolved that the Section on Obstetrics of the Southern Medical Association goes on record as categorically opposing any changes in program planning that in any way reduces the autonomy and separate entity status of this Section, and

BE IT FURTHER RESOLVED that this Section respectfully petitions the Council of the Southern Medical Association that they take no steps of any sort that will reduce the program time available to this Section or in any way alter its present autonomous position.

The Nominating Committee reported the following nominations for the Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Williamson Z. Bradford, Charlotte, North Carolina.
Vice-Chairman—Dr. Walter A. Ruch, Memphis, Tennessee.
Secretary—Dr. Hugh G. Hamilton, Kansas City, Missouri.

The Section then adjourned *sine die*.

SECTION ON GYNECOLOGY

Officers

Chairman—Dr. Charles J. Collins, Orlando, Florida.
Vice-Chairman—Dr. Walter L. Thomas, Durham, North Carolina.
Secretary—Dr. Curtis J. Lund, New Orleans, Louisiana.

Tuesday, November 15, 2:00 p.m.

The Section met in the Hotel Gibson, Ballroom, Cincinnati, and was called to order by the Chairman, Dr. Charles J. Collins, Orlando, Florida, who presided.

The Chairman appointed the following Nominating Committee: Dr. John W. Turner, Chairman, Atlanta, Georgia; Dr. Lee F. Turlington, Birmingham, Alabama; and Dr. W. O. Johnson, Louisville, Kentucky.

SYMPOSIUM ON THE MANAGEMENT OF COMMON GYNECOLOGICAL DIFFICULTIES

Paper by Dr. Curtis Tyrone, Associate Clinical Professor of Gynecology, and Dr. John C. Weed, Assistant Clinical Professor of Gynecology, Tulane University School of Medicine, New Orleans, Louisiana, entitled "Modern Trends in Treatment of Pelvic Endometriosis" (Lantern Slides), was read by Dr. Tyrone, and was discussed by Dr. W. Nicholson Jones, Birmingham, Alabama; Dr. Karl John Karnaky, Houston, Texas; Dr. H. Hudnall Ware, Richmond, Virginia; Dr. Hugh G. Hamilton, Kansas City, Missouri; and in closing by Dr. Tyrone.

Paper by Dr. Lucius Burch, Visiting Gynecologist, Nashville General Hospital, and Dr. John Burch, Professor of Gynecology, Vanderbilt University School of Medicine, Nashville, Tennessee, entitled "Endometrial Hyperplasia: Past and Present Concept," was read by Dr. Lucius Burch, and was discussed by Dr. Charles Bahl, Cincinnati, Ohio; Dr. J. Hofbauer, Cincinnati, Ohio; and in closing by Dr. Lucius Burch.

Dr. Andrew Marchetti, Professor of Obstetrics and Gynecology, Georgetown University School of Medicine, Washington, D. C., read a paper entitled "Urinary Incontinence" (Lantern Slides), which was discussed by Dr. William T. Black, Memphis, Tennessee; Dr. Oren Moore, Charlotte, North Carolina; Dr. Gordon G. Allison, Atlanta, Georgia; Dr. Curtis J. Lund, New Orleans, Louisiana; and in closing by the essayist.

Dr. Bayard Carter, Professor of Obstetrics and Gynecology, Duke University Hospital, Durham, North Carolina, read a paper entitled "Prolapse of Uterus, of the Cervical Stump, and of the Vaginal Vault: Indications for Operation," which was discussed by Dr. Olin S. Cofer, Atlanta, Georgia.

The Section then adjourned until 2:00 p.m. Wednesday.

Wednesday, November 16, 2:00 p.m.

The Section met in the Hotel Gibson, Ballroom, Cincinnati, and was called to order by the Chairman, Dr. Collins, who presided.

Paper by Dr. Abe Golden, Clinical Instructor of Obstetrics and Gynecology, Louisiana State University School of Medicine, and Dr. Leo Abraham, New Orleans, Louisiana, entitled "Trauma of the Urinary Bladder in Gynecological Surgery" (Lantern Slides), was read by Dr. Golden, and was discussed by Dr. Edwin P. Solomon, Louisville, Kentucky; Dr. M. Y. Dabney, Birmingham, Alabama; and in closing by Dr. Golden.

Dr. Charles J. Collins, Orlando, Florida, read his Chairman's Address, entitled "Low Dosage Pituitary-Ovarian Irradiation in Secondary Amenorrhea and Associated Sterility" (Lantern Slides).

Dr. Paul F. Fletcher, Senior Instructor of Obstetrics and Gynecology, St. Louis University School of Medicine, St. Louis, Missouri, read a paper entitled "The Prophylactic Use of Penicillin Vaginal Suppositories in Gynecological Surgery" (Lantern Slides), which was discussed by Dr. Frank R. Lock, Winston-Salem, North Carolina; Dr. Harry A. Pearse, Detroit, Michigan; and in closing by the essayist.

Dr. Robert Kimbrough, Professor and Chairman of Obstetrics and Gynecology, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania, read a paper entitled "Carcinoma of the Endometrium" (Lantern Slides).

Dr. William Bickers, Instructor of Gynecology, Medical College of Virginia, Richmond, Virginia, read a paper entitled "Dysmenorrhea-Myometrial Contraction Patterns Following Presacral Neurectomy" (Lantern Slides), which was discussed by Dr. R. A. Woodbury, Memphis, Tennessee; Dr. Chester D. Bradley, Newport News, Virginia; and in closing by the essayist.

The following resolution was presented and adopted unanimously:

WHEREAS, the National Federation of Obstetric and Gynecologic Societies has as one of its objects "To serve as the coordinating group for the obstetrical and/or gynecological organizations in the United States of America," and

WHEREAS, the Section on Gynecology of the Southern Medical Association should have direct representation on the Board of Governors of said Federation, and

WHEREAS, this body is eligible for affiliation under Article IV, Section E, without any financial obligations; now,

THEREFORE BE IT RESOLVED, that this Section does hereby go on record as being in favor of such an affiliation.

The following resolution was presented and adopted unanimously:

WHEREAS, in the last thirty years, the specialties of gyne-

cology and obstetrics have developed in breadth and scope so as now to embrace approximately thirty per cent of the entire practice of medicine,

THEREFORE, be it hereby resolved that the Section on Gynecology goes on record as categorically opposing any changes in program planning that in any way reduces the autonomy and separate entity status of this and its allied Section on Obstetrics, and

BE IT FURTHER RESOLVED that this Section respectfully petitions the Council of the Southern Medical Association that no steps be taken which will reduce the program time available to this section or in any way alter its present autonomous position.

The Nominating Committee reported the following nominations for the Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Walter L. Thomas, Durham, North Carolina.
Vice-Chairman—Dr. J. Randolph Perdue, Miami, Florida.
Secretary—Dr. Curtis J. Lund, New Orleans, Louisiana.

The Section then adjourned *sine die*.

SECTION ON UROLOGY

Officers

Chairman—Dr. James L. Estes, Tampa, Florida.
Vice-Chairman—Dr. M. K. Bailey, Atlanta, Georgia.
Secretary—Dr. Robert F. Sharp, New Orleans, Louisiana.

Wednesday, November 16, 2:00 p.m.

The Section met in the Gibson Hotel, Victory Room, Cincinnati, and was called to order by the Chairman, Dr. James L. Estes, Tampa, Florida, who presided.

The Chairman appointed the following Nominating Committee: Dr. Rex E. Van Duzen, Chairman, Dallas, Texas; Dr. J. Ullman Reaves, Mobile, Alabama; and Dr. Robert Lich, Jr., Louisville, Kentucky.

Paper by Dr. Arthur J. Butt and Dr. Joseph Q. Perry, Pensacola, Florida, entitled "Oliguria and Anuria Due to Sulfonamides: A Report of 15 Cases" (Lantern Slides), was read by Dr. Butt, and was discussed by Dr. Hjalmar E. Carlson, Kansas City, Missouri; Dr. Samuel A. Vest, Charlottesville, Virginia; and Dr. Nelse F. Ockerblad, Kansas City, Missouri.

Dr. Robert Lich, Jr., Louisville, Kentucky, read a paper entitled "Some Practical Considerations Concerning Fluid and Electrolyte Therapy" (Lantern Slides), which was discussed by Dr. Harold P. McDonald, Atlanta, Georgia.

Paper by Dr. Harold A. O'Brien, Dr. Joseph D. Mitchell and Dr. E. C. St. Martin, Dallas, Texas, entitled "Carcinoma of the Male Urethra," was read by Dr. O'Brien, and was discussed by Dr. Samuel A. Vest, Charlottesville, Virginia; Dr. Harry M. Spence, Dallas, Texas; Dr. G. E. Johnson, Ardmore, Oklahoma; Dr. Fred K. Garvey, Winston-Salem, North Carolina; Dr. Monroe Wolf, New Orleans, Louisiana; and in closing by Dr. O'Brien.

Paper by Dr. Fred K. Garvey, Dr. W. A. Cline and Dr. Manson Meads, Winston-Salem, North Carolina, entitled "A Clinical Experimental Study on the Use of Chloromycetin in Bacillary Infections of the Urinary Tract" (Lantern Slides), was read by Dr. Cline, and was discussed by Dr. Grayson L. Carroll, St. Louis, Missouri; and in closing by Dr. Cline.

Dr. Hugh J. Jewett, Baltimore, Maryland, read a paper entitled "Carcinoma of the Bladder: Treatment and Prognosis" (Lantern Slides), which was discussed by Dr. Wm. F. Melick, St. Louis, Missouri; Dr. Nelse F. Ockerblad, Kansas City, Missouri; Dr. Rex E. Van Duzen, Dallas, Texas; Dr. H. P. McDonald, Atlanta, Georgia; and in closing by the essayist.

Paper by Dr. G. Madison Roberts, Sr., Dr. Gilbert M. Roberts, Jr., Dr. Augustus McCravey and Dr. Walter E. Boehm, Chattanooga, Tennessee, entitled "Management of Cord Bladder," was read by Dr. Gilbert M. Roberts, Jr., and was discussed by Dr. R. Carl Bunts, Richmond, Virginia.

The Section then adjourned until 2:00 p.m. Thursday.

Thursday, November 17, 2:00 p.m.

The Section met in the Gibson Hotel, Victory Room, Cincinnati, and was called to order by the Chairman, Dr. Estes, who presided.

Paper by Dr. Charles Rieser, Dr. Chester A. Fort and Dr. J. Denny Moffett, Jr., Atlanta, Georgia, entitled "Localized Intrarenal Cystic Disease of the Kidney: Report of Two Cases" (Lantern Slides), was read by Dr. Moffett, and was discussed by Dr. W. Vinson Pierce, Covington, Kentucky; Dr. Monroe Wolf, New Orleans, Louisiana; and in closing by Dr. Rieser.

Dr. Landon Timberlake, Birmingham, Alabama, read a paper entitled "Leiomyosarcoma of the Kidney: Case Report of a Rare Tumor," which was discussed by Dr. W. Clifton Lott, Asheville, North Carolina; Dr. Nelse F. Ockerblad, Kansas City, Missouri; and in closing by the essayist.

Dr. James L. Estes, Tampa, Florida, read his Chairman's Address entitled "Pioneers in Urology in the South" (Lantern Slides).

Dr. David M. Davis, Professor of Urology, Jefferson Medical College of Philadelphia, Philadelphia, Pennsylvania, read a paper entitled "Ureteral Intubation" (Lantern Slides), which was discussed by Dr. Harry M. Spence, Dallas, Texas; and in closing by the essayist.

Paper by Dr. H. Haynes Baird, Dr. Hamilton W. McKay and Dr. Paul Kimmelstiel, Charlotte, North Carolina, entitled "Ischemic Infarction of the Prostate Gland" (Lantern Slides), was read by Dr. Baird, and was discussed by Dr. Nelse F. Ockerblad, Kansas City, Missouri; Dr. Monroe Wolf, New Orleans, Louisiana; and in closing by Dr. Kimmelstiel and Dr. Baird.

Paper by Dr. Harry M. Spence and Dr. Sidney S. Baird, Dallas, Texas, entitled "Two-Stage Operation for Correction of Hypospadias" (Motion Pictures), was read by Dr. Spence, and was discussed by Dr. John M. Townsend, Louisville, Kentucky; and Dr. David M. Davis, Philadelphia, Pennsylvania.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Robert F. Sharp, New Orleans, Louisiana.
Vice-Chairman—Dr. W. Vinson Pierce, Covington, Kentucky.
Secretary—Dr. Harold P. McDonald, Atlanta, Georgia.

The Section then adjourned *sine die*.

SECTION ON PROCTOLOGY

Officers

Chairman—Dr. Hoyt R. Allen, Little Rock, Arkansas.
Vice-Chairman—Dr. Ronald F. Elkins, Springfield, Missouri.
Secretary—Dr. Rufus C. Alley, Lexington, Kentucky.

Tuesday, November 15, 9:00 a.m.

The Section met in the Netherland Plaza Hotel, Parlors A-B-C-D, Cincinnati, and was called to order by the Vice-Chairman, Dr. Ronald F. Elkins, Springfield, Missouri, who presided.

Due to illness of the Chairman, Dr. Hoyt R. Allen, Little Rock, Arkansas, his Address entitled "Some Aspects of National Medicine," was read by the Secretary, Dr. Rufus C. Alley.

Dr. George H. Thiele, Kansas City, Missouri, read a paper entitled "Constipation: Its Relationship to Anorectal Disease and to Fluid Intake and Diet" (Lantern Slides), which was discussed by Dr. Julius E. Linn, Birmingham, Alabama; and Dr. Charles E. Howard, Cincinnati, Ohio.

Dr. Louis J. Hirschman, Detroit, Michigan, read a paper entitled "Some Practical Points in Fistula Surgery" (Lantern Slides), which was discussed by Dr. Garnet W. Ault, Washington, D. C.; Dr. William T. Brockman, Greenville, South Carolina; Dr. George H. Thiele, Kansas City, Missouri; and in closing by the essayist.

The Vice-Chairman named the following Nominating Committee: Dr. William T. Brockman, Chairman, Greenville, South Carolina; Dr. J. Milton Stockman, Knoxville, Tennessee; and Dr. Julius E. Linn, Birmingham, Alabama.

Dr. Marion C. Pruitt, Atlanta, Georgia, read a paper entitled "The Evaluation of Procedures and Findings in Proctologic Examinations," which was discussed by Dr. C. Ross Deeds, Hendersonville, North Carolina; Dr. James E. Ryan, Louisville, Kentucky; and in closing by the essayist.

Dr. O. T. Evans, Lexington, Kentucky, read a paper entitled "Radiation Proctitis: Diagnosis and Treatment," which was discussed by Dr. Louis J. Hirschman, Detroit, Michigan; and in closing by the essayist.

Dr. Raymond L. Murdoch, Oklahoma City, Oklahoma, read a paper entitled "Sigmoido-Rectal Prolapse and the Terminal Bowel Intussusception Syndrome" (Lantern Slides), which was discussed by Dr. Carroll M. Pounders, Oklahoma City, Oklahoma; Dr. Stewart R.

Jones, Cincinnati, Ohio; Dr. Alfred O. Colquitt, Jr., Spartanburg, South Carolina; and in closing by the essayist.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Rufus C. Alley, Lexington, Kentucky.
Vice-Chairman—Dr. Julius E. Linn, Birmingham, Alabama.
Secretary—Dr. Ronald F. Elkins, Springfield, Missouri.

The Section then adjourned *sine die*.

SECTION ON ANESTHESIOLOGY

Officers

Chairman—Dr. Robert A. Miller, San Antonio, Texas.
Vice-Chairman—Dr. Ralph S. Sappenfield, Miami, Florida.
Secretary—Dr. David A. Davis, Augusta, Georgia.

Tuesday, November 15, 9:00 a.m.

The Section met in the Netherland Plaza Hotel, Hall of Mirrors, Cincinnati, and was called to order by the Chairman, Dr. Robert A. Miller, San Antonio, Texas, who read his Chairman's Address entitled "The Future of Anesthesiology and Medical Education," which was discussed by Dr. Carl R. Damron, Mansfield, Ohio; and Dr. Donald H. Stubbs, Washington, D. C.

The Chairman appointed the following Nominating Committee: Dr. Ralph M. S. Barrett, Chairman, Clayton, Missouri; Dr. Fred E. Woodson, Tulsa, Oklahoma; and Dr. Donald H. Stubbs, Washington, D. C.

Paper by Dr. Seymour Alpert, Dr. Lloyd H. Mousel and Dr. Charles S. Coakley, Washington, D. C., entitled "The Use of Combinations of Avertin, Pentothal Sodium and Nitrous Oxide for Operations about the Head and Neck," was read by Dr. Alpert and was discussed by Dr. Carl C. Damron, Mansfield, Ohio; Dr. R. P. Bergner, Louisville, Kentucky; Dr. Donald H. Stubbs, Washington, D. C.

Paper by Dr. Willard D. Bennett, Louisville, Kentucky, and Dr. Milton Davis, Jr., Danville, Kentucky, entitled "Cardiac Arrythmias During Clinical Anesthesia," was read by Dr. Bennett and was discussed by Dr. Donald H. Stubbs, Washington, D. C.; and in closing by Dr. Davis.

Paper by Dr. Harold J. Freiheit and Dr. Ralph M. S. Barrett, Clayton, Missouri, entitled "Prolonged Spinal Anesthesia, Using Pitressin," was read by Dr. Freiheit, and was discussed by Dr. Frank S. Brannen, Chattanooga, Tennessee.

Paper by Dr. H. Kretchmer and Dr. John Adriani, New Orleans, Louisiana, entitled "A Comparative Study of Some Newer Vasoconstrictors on the Duration of Spinal Anesthesia with Procaine," was read by Dr. Kretchmer, and was discussed by Dr. Frank S. Brannen, Chattanooga, Tennessee.

Paper by Dr. Paul W. Searles, Professor of Anesthesiology, and Dr. William K. Nowill, Clinical Assistant in Anesthesiology, University of Buffalo School of Medicine, Buffalo, New York, entitled "Stellate Ganglion Block in the Treatment of Cerebral Vascular Accidents," was read by Dr. Searles, and was discussed by Dr. Seymour Alpert, Washington, D. C.; Dr. Ralph M. S. Barrett, Clayton, Missouri; Dr. David A. Davis, Augusta, Georgia; and in closing by Dr. Searles.

Dr. Fred E. Woodson of Tulsa, Oklahoma, a member of the Council of the Southern Medical Association, reported that a special committee of the Council was considering the status of the various sections, their relationship to other sections and a program plan for each section. He brought out the fact that our Section on Anesthesiology is not properly represented on the American Board of Anesthesiology.

Dr. Donald H. Stubbs, Washington, D. C., presented the following resolution which was passed by the Section:

WHEREAS, the general development and advancement of medicine in the South can be more helped by the Southern Medical Association than it can by any other organized instrumentality, and

WHEREAS, the specific needs of anesthesiology require that these specialists associate themselves closely with the general field of medicine for the common good, thus giving an imperative reason for strengthening and developing the Section on Anesthesiology of the Southern Medical Association, and

WHEREAS, national training and certification policies in anesthesiology are a concern of this Section, and finally,

WHEREAS, the present relationship of the Southern Medical Association to the American Board of Anesthesiology is in doubt, now

THEREFORE BE IT RESOLVED, that a committee be named to obtain full information on this matter for later report to the Section on Anesthesiology, and

BE IT FURTHER RESOLVED, that this committee, joined by the officers of the Section, may, in their judgment, give the information so obtained on this matter to the Council of the Southern Medical Association in the interim between regular meetings.

The Chairman appointed on the committee provided for in the above resolution Dr. Fred E. Woodson, Chairman, Tulsa, Oklahoma; Dr. R. M. S. Barnett, St. Louis, Missouri; and Dr. Donald H. Stubbs, Washington, D. C.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Perry P. Volpitto, Augusta, Georgia.
Vice-Chairman—Dr. Ralph S. Sappenfield, Miami, Florida.
Secretary—Dr. David A. Davis, Augusta, Georgia.

The Section then adjourned *sine die*.

SECTION ON OPHTHALMOLOGY AND OTOLARYNGOLOGY

Officers

Chairman—Dr. Murdock Equen, Atlanta, Georgia.
Chairman-Elect—Dr. Alston Callahan, Birmingham, Alabama.
Vice-Chairman—Dr. Bascom H. Palmer, Miami, Florida.
Secretary—Dr. Edley H. Jones, Vicksburg, Mississippi.

Tuesday, November 15, 2:00 p.m.

OTOLARYNGOLOGY

The Section met in the Netherland Plaza Hotel, Hall of Mirrors, Cincinnati, and was called to order by the Chairman, Dr. Murdock Equen, Atlanta, Georgia, who presided.

Paper by Dr John J. Shea and Dr. Jos. A. Buchignani, Memphis, Tennessee, entitled "Virus Infections of the Nose and Throat with Particular Reference to Acute Infectious Mononucleosis" (Lantern Slides), was read by Dr. Shea, and was discussed by Dr. Henry M. Goodyear, Cincinnati, Ohio.

Dr. Murdock Equen, Ponce de Leon Ear, Nose and Throat Infirmary, Atlanta, Georgia, read his Chairman's Address, entitled "The Use of the Magnet in the Lungs and Upper Digestive Tract" (Lantern Slides).

Dr. Dean M. Lierle, Professor and Head of the Department of Otolaryngology and Oral Surgery, State University of Iowa College of Medicine, Iowa City, Iowa, read a paper entitled "The Present Status of the Submucous Operation" (Lantern Slides and Motion Pictures), following which Dr. Lierle answered questions from the floor.

Dr. Francis E. LeJeune, New Orleans, Louisiana, read a paper entitled "The Early Diagnosis of Cancer of the Larynx" (Lantern Slides), which was discussed by Dr. Millard F. Arbuckle, St. Louis, Missouri.

Dr. Frank L. Bryant, Shreveport, Louisiana, read a paper entitled "The Fractured Nose, Recent and Neglected" (Lantern Slides), which was discussed by Dr Maynard P. Smith, Richmond, Virginia.

Dr. William D. Gill, San Antonio, Texas, read a paper entitled "External Otitis: Some Comments Concerning Present Status of Treatment," which was discussed by Dr. M. H. Hood, Portsmouth, Virginia.

The Chairman appointed the following Nominating Committee: Dr. E. W. Rucker, Jr., Chairman, Birmingham, Alabama; Dr. John J. Shea, Memphis, Tennessee; Dr. Elbyrne G. Gill, Roanoke, Virginia; Dr. J. W. Jervey, Jr., Greenville, South Carolina; Dr. W. Raymond McKenzie, Baltimore, Maryland; and Dr. Lucian W. Alexander, New Orleans, Louisiana.

The Section then adjourned until 2:00 p.m. Wednesday.

Wednesday, November 16, 2:00 p.m.

The Section met in the Netherland Plaza Hotel, Hall of Mirrors, Cincinnati, and was called to order by the Secretary, Dr. Edley H. Jones, Vicksburg, Mississippi.

Dr. Elbyrne G. Gill, Roanoke, Virginia, read a paper entitled "The Effects of Air Pollution on the Respiratory Tract" (Lantern Slides), which was discussed by Dr. Clarence Mills, Cincinnati, Ohio; Dr. W. J. Judy, East Rainelle, West Virginia.

Dr. Robin Harris, Jackson, Mississippi, read a paper entitled "The Treatment of the Premonitory Signs and Symptoms of Meniere's Symptom Complex" (Lantern Slides), which was discussed by Dr. W. W. Wilkerson, Jr., Nashville, Tennessee; Dr. Elbyrne G. Gill, Roanoke, Virginia; and in closing by the essayist.

Dr. W. Raymond McKenzie, Baltimore, Maryland, read a paper entitled "Acute Sinusitis with Orbital Cellulitis" (Lantern Slides), which was discussed by Dr. J. W. Jervey, Jr., Greenville, South Carolina; Dr. Oscar Wilkinson, Washington, D. C.; and in closing by the essayist.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Alston Callahan, Birmingham, Alabama.
Chairman-Elect—Dr. Francis E. LeJeune, New Orleans, Louisiana.
Vice-Chairman—Dr. Edwin N. Broyles, Baltimore, Maryland.
Secretary—Dr. Edley H. Jones, Vicksburg, Mississippi.

OPHTHALMOLOGY

Dr. Marion W. Hester, Lakeland, Florida, read a paper entitled "Dacryocystorhinostomy: The External Approach" (Lantern Slides and Motion Pictures), which was discussed by Dr. William B. Clark, New Orleans, Louisiana; Dr. Oscar Wilkinson, Washington, D. C.; and in closing by the essayist.

Dr. Frederick W. Stocker, Durham, North Carolina, read a paper entitled "The Use of Antihistaminic Drugs in Ophthalmology" (Lantern Slides), which was discussed by Dr. Albert L. Brown, Cincinnati, Ohio.

Dr. T. E. Sanders, St. Louis, Missouri, read a paper entitled "The Ocular Manifestations of Skin Disease" (Lantern Slides), which was discussed by Dr. Wm. Banks Anderson, Durham, North Carolina; and in closing by the essayist.

The Section then adjourned until 2:00 p.m. Thursday.

Thursday, November 17, 2:00 p.m.

The Section met in the Netherland Plaza Hotel, Hall of Mirrors, Cincinnati, and was called to order by the Chairman, Dr. Equen, who presided.

Dr. Bennett Y. Alvis, St. Louis, Missouri, read a paper entitled "The Clinical Treatment of Acute and Chronic Uveitis" (Lantern Slides and Motion Pictures), which was discussed by Dr. Edwin W. Burton, Charlottesville, Virginia; and in closing by the essayist.

Dr. R. Townley Paton, Clinical Professor of Ophthalmology, New York University College of Medicine; Surgeon, Director, Manhattan Eye, Ear and Throat Hospital, and Vice-President, Eye Bank for Sight Restoration, New York, New York, read a paper entitled "Lamellar Transplantations: Indications and Contraindications" (Lantern Slides and Motion Pictures), which was discussed by Dr. Edley H. Jones, Vicksburg, Mississippi; Dr. Alston Callahan, Birmingham, Alabama; and in closing by the essayist.

Dr. Edward W. Griffey, Houston, Texas, read a paper entitled "Sight Conservation in Industry: A Program for the Elimination of Eye Hazards," which was discussed by Dr. Donald J. Lyle, Cincinnati, Ohio; Dr. Karl B. Benkwith, Montgomery, Alabama; Dr. Edley H. Jones, Vicksburg, Mississippi; and in closing by the essayist.

Dr. Karl B. Benkwith, Montgomery, Alabama, read a paper entitled "Clinical Aspects of Concomitant Strabismus," which was discussed by Dr. J. Wesley McKinney, Memphis, Tennessee; Dr. Edward W. Griffey, Houston, Texas; and in closing by the essayist.

Dr. Oscar M. Marchman, Jr., Dallas, Texas, read a paper entitled "The Management of Perforating Wounds of the Eye," which was discussed by Dr. Charles T. Moran, Louisville, Kentucky.

Dr. Angus L. MacLean, Baltimore, Maryland, read a paper entitled "Trephine and Intracapsular Extraction Combined in One Procedure for Primary Glaucoma and Cataract" (Motion Pictures), which was discussed by Dr. Richard A. Hoffman, Cincinnati, Ohio; Dr. Alston Callahan, Birmingham, Alabama; and in closing by the essayist.

The Section then adjourned *sine die*.

SECTION ON MEDICAL EDUCATION AND HOSPITAL TRAINING

Officers

Chairman—Dr. Vernon W. Lippard, Charlottesville, Virginia.
Vice-Chairman—Dr. Joseph E. Markee, Durham, North Carolina.
Secretary—Dr. Trawick H. Stubbs, Columbia, Missouri.

Wednesday, November 16, 9:00 a.m.

The Section met in the Netherland Plaza Hotel, Parlors A-B-C-D, Cincinnati, and was called to order by the Chairman, Dr. Vernon W. Lippard, Dean, University of Virginia School of Medicine, Charlottesville, Virginia, who read his Chairman's Address, entitled "Some Lessons We May Learn from the Italian Program of Medical Education."

Dr. Robert P. Walton, Professor of Pharmacology, Medical College of the State of South Carolina, Charleston, South Carolina, read a paper entitled "The Current Status of Films in Medical Teaching" (Motion Pictures), which was discussed by Dr. Joseph E. Markee, Durham, North Carolina; and Dr. D. S. Pankratz, University, Mississippi.

Dr. Dean F. Smiley, Secretary, Association of American Medical Colleges, Chicago, Illinois, read a paper entitled "Some Problems Facing Our Medical Schools," which was discussed by Dr. Stanley E. Dorst, Cincinnati, Ohio.

The Chairman appointed the following Nominating Committee: Dr. Murray C. Brown, Chairman, Nashville, Tennessee; Dr. Richard Hugh Wood, Emory University, Georgia; and Dr. Cyrus C. Erickson, Durham, North Carolina.

SYMPOSIUM ON THE REGIONAL PLAN FOR MEDICAL EDUCATION

Mr. William J. McGlothlin, Associate Director, Board of Control for Southern Regional Education, Atlanta, Georgia, read a paper entitled "Implications of the Regional Program for Medical Education."

Dr. D. S. Pankratz, Dean, University of Mississippi School of Medicine, University, Mississippi, read a paper entitled "The Regional Program and Participation of Institutions Presenting a Need."

Dr. R. Hugh Wood, Dean, Emory University School of Medicine, Emory University, Georgia, read a paper entitled "The Regional Program and Participation of Institutions Meeting the Need."

The Symposium was discussed by Dr. W. T. Sanger, Richmond, Virginia; Dr. Wilson T. Sowder, Jacksonville, Florida; Dr. Murray C. Brown, Nashville, Tennessee; Dr. Russell L. Holman, New Orleans, Louisiana; Dr. D. S. Pankratz, University, Mississippi; Dr. Trawick H. Stubbs, Columbia, Missouri; Dr. Joseph E. Markee, Durham, North Carolina; Mr. William J. McGlothlin, Atlanta, Georgia; and Dr. Vernon W. Lippard, Charlottesville, Virginia.

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. Joseph E. Markee, Durham, North Carolina.
Vice-Chairman—Dr. W. T. Sanger, Richmond, Virginia.
Secretary—Dr. Trawick H. Stubbs, Columbia, Missouri.

The Section then adjourned *sine die*.

SECTION ON PUBLIC HEALTH

Officers

Chairman—Dr. George A. Dame, Jacksonville, Florida.
Vice-Chairman—Dr. Thomas F. Sellers, Atlanta, Georgia.
Secretary—Dr. Waldo L. Treuting, New Orleans, Louisiana.

Tuesday, November 15, 9:00 a.m.

The Section met in the Gibson Hotel, Victory Room, Cincinnati, and was called to order by the Chairman, Dr. George A. Dame, Director, Bureau of Local Health Service, Florida State Board of Health, Jacksonville, Florida, who read his Chairman's Address, entitled "Local Health Services."

The Chairman appointed the following Nominating Committee: Dr. Ben F. Wyman, Chairman, Columbia, South Carolina; Dr. Geo. M. Cooper, Raleigh, North Carolina; and Dr. A. L. Gray, Jackson, Mississippi.

Paper by Dr. Leona Baumgartner and Dr. Eleanor P. Hunt, U. S. Children's Bureau, Federal Security Agency, Washington, D. C., entitled "Progress in Reduction of Infant Mortality and the Tasks Ahead" (Lantern Slides), was read by Dr. Hunt, and was discussed by Dr. W. P. Gardiner, New Orleans, Louisiana; Dr. John J. Phair, Cincinnati, Ohio; and in closing by Dr. Hunt.

In the absence of Dr. L. J. Roper, State Commissioner of Health, Richmond, Virginia, the subject "The Virginia Alcohol Studies Program," was presented by Dr. Kenneth F. Lee, Richmond, Virginia.

Dr. A. L. Gray, Director, Division of Preventable Disease Control, Mississippi State Board of Health, Jackson, Mississippi, read a paper entitled "Diarrheal Diseases in the South, which was discussed by Dr. Albert V. Hardy, Jacksonville, Florida.

Dr. Walton H. Y. Smith, Montgomery, Alabama, read a paper

entitled "Effectiveness of Alabama's Mass Blood Testing Program" (Lantern Slides), which was discussed by Dr. S. Ross Taggart, Washington, D. C.

Dr. George M. Cooper, North Carolina State Board of Health, Raleigh, North Carolina, read a paper entitled "Follow-Up Problems Encountered in the 1948 Poliomyelitis Epidemic in North Carolina: A Brief Description of Procedures Adopted to Meet the Public Health Issues Involved."

The Nominating Committee reported the following nominations for Section officers, the nominees being duly elected by vote of the Section:

Chairman—Dr. T. F. Sellers, Atlanta, Georgia.
Vice-Chairman—Dr. L. M. Graves, Memphis, Tennessee.
Secretary—Dr. Waldo L. Treuting, New Orleans, Louisiana.

The Section then adjourned *sine die*.

AMERICAN COLLEGE OF CHEST PHYSICIANS
Southern Chapter

Meeting conjointly with Southern Medical Association

Officers

President—Dr. Dean B. Cole, Richmond, Virginia.
First Vice-President—Dr. David H. Waterman, Knoxville, Tennessee.
Second Vice-President and Chairman of Program Committee—Dr. M. Jay Flipse, Miami, Florida.
Secretary-Treasurer—Dr. Hollis E. Johnson, Nashville, Tennessee.

Sunday, November 13, 2:00 p.m.

The American College of Chest Physicians, Southern Chapter, met at the Gibson Hotel, Cincinnati, Dr. M. Jay Flipse, Miami, Florida, Chairman, Medical Section, presiding.

Paper by Dr. James J. Calloway and Dr. Robert H. Furman, Nashville, Tennessee, entitled "Artificial Pneumoperitoneum in the Treatment of Pulmonary Emphysema," was presented and was discussed by Dr. David H. Waterman, Knoxville, Tennessee; Dr. Osler A. Abbott, Atlanta, Georgia; Dr. Alvis E. Greer, Houston, Texas; and Dr. Hollis E. Johnson, Nashville, Tennessee.

Paper by Dr. Edgar Woody, Dr. Roy Avery, Dr. Raymond R. Crowe and Dr. Hollis E. Johnson, Nashville, Tennessee, entitled "Treatment of Pulmonary Tuberculosis with Streptomycin and Potassium Iodide," was presented and was discussed by Dr. Paul A. Turner, Louisville, Kentucky; Dr. Duane Carr, Memphis, Tennessee; Dr. M. Jay Flipse, Miami, Florida; Dr. Walter E. Vest, Huntington, West Virginia; and Dr. Hollis E. Johnson, Nashville, Tennessee.

Dr. M. Eugene Flipse, Miami, Florida, read a paper entitled "Spontaneous Rupture of Esophagus," which was discussed by Dr. Osler A. Abbott, Atlanta, Georgia; and Dr. Norman H. Wilson, Brookline, Massachusetts.

Dr. George R. Hodell, Houston, Texas, read a paper entitled "Roll of Bronchoscopy in Pneumothorax Management," which was discussed by Dr. Paul A. Turner, Louisville, Kentucky; and Dr. David H. Waterman, Knoxville, Tennessee.

A social hour was held at the Gibson Hotel, followed by the President's Banquet at 7:30 p.m., Dr. David H. Waterman, Knoxville, Tennessee, Toastmaster. Addresses were given by Dr. Dean B. Cole, President, Southern Chapter, American College of Chest Physicians, Richmond, Virginia, and by Dr. Paul A. Turner, Chairman, Board of Regents, American College of Chest Physicians, Louisville, Kentucky. An X-Ray Conference, Dr. M. Jay Flipse, Miami, Florida, Moderator, concluded the evening program.

Monday, November 14, 9:00 a.m.

The American College of Chest Physicians, Southern Chapter, met at the Gibson Hotel, Cincinnati, Dr. Duane Carr, Memphis, Tennessee, Chairman, Surgical Section, presiding.

Paper by Dr. David H. Waterman and Dr. Sheldon E. Domm, Knoxville, Tennessee, entitled "Decortication of the Unexpandable Pneumothorax Lung" was presented and was discussed by Dr. A. Worth Hobby, Atlanta, Georgia; Dr. Walter E. Vest, Huntington, West Virginia; Dr. Robert L. McCracken, Nashville, Tennessee; Dr. Paul A. Turner, Louisville, Kentucky; Dr. John S. Harter, Louisville, Kentucky; and Dr. Norman H. Wilson, Brookline, Massachusetts.

Paper by Dr. J. Ray Bryant and Dr. John S. Harter, Louisville, Kentucky, entitled "Middle Lobe Disease," was presented and was discussed by Dr. David H. Waterman, Knoxville, Tennessee; and Dr. Duane Carr, Memphis, Tennessee.

Paper by Dr. Edward Skinner, Dr. Duane Carr, Dr. Charles R. Kessler and Dr. William E. Denman, Memphis, Tennessee, entitled "Chest Trauma in Civilian Practice," was presented and was discussed by Dr. Sheldon E. Domm, Knoxville, Tennessee; Dr. Peachy R. Gilmer, Shreveport, Louisiana; Dr. Robert L. McCracken, Nashville, Tennessee; Dr. R. O. Joplin, Louisville, Kentucky; Dr. A. Worth Hobby, Atlanta, Georgia; Dr. John S. Harter, Louisville, Kentucky; and Dr. Norman H. Wilson, Brookline, Massachusetts.

Paper by Dr. Frank Philip Coleman and Dr. George H. Bunch, Jr., Richmond, Virginia, entitled "Acquired Nonmalignant Esophagotracheobronchial Fistulas," was presented and was discussed by Dr. Norman H. Wilson, Brookline, Massachusetts; Dr. Duane Carr, Memphis, Tennessee; Dr. David H. Waterman, Knoxville, Tennessee; and Dr. M. Jay Flipse, Miami, Florida.

Monday, November 14, 12:30 p.m.

At a luncheon meeting at the Gibson Hotel, Dr. Dean B. Cole, Richmond, Virginia, President, Southern Chapter, presiding, an address was given by Dr. Norman J. Wilson, Brookline, Massachusetts, entitled "The Place of Pulmonary Resection in the Treatment of Pulmonary Tuberculosis."

At a business meeting, which concluded the program, the following officers were elected:

President—Dr. David H. Waterman, Knoxville, Tennessee.
First Vice-President—Dr. M. Jay Flipse, Miami, Florida.
Second Vice-President and Chairman of Program Committee—Dr. Hollis E. Johnson, Nashville, Tennessee.
Secretary-Treasurer—Dr. George R. Hodell, Houston, Texas.

COLLEGE OF AMERICAN PATHOLOGISTS
Southeastern Section

Meeting conjointly with Section on Pathology of Southern Medical Association

Chairman—Dr. Wiley D. Forbus, Durham, North Carolina.

Monday, November 14, 9:00 a.m.

College of American Pathologists, Southeastern Section, met at the Netherland Plaza Hotel, Pavillon Caprice, Cincinnati, and was called to order by Dr. Wiley D. Forbus, Chairman, who discussed briefly the functions of the College. He asked Dr. E. S. Maxwell, Lexington, Kentucky, Chairman of the Local Committee, to preside.

Dr. Coy C. Carpenter, Winston-Salem, North Carolina, read a paper entitled "The Pathologist's Role as a Citizen of His Community."

Dr. Ralph M. Hartwell, New Orleans, Louisiana, read a paper entitled "The Legal Status of Pathology and the Pathologist."

Dr. Paul Kimmelstiel, Charlotte, North Carolina, read a paper entitled "The Pathologist as a Teacher of the Hospital Staff."

Dr. Robert E. Stowell, Kansas City, Kansas, read a paper entitled "New Technical Approaches to the Solution of Pathological Problems."

Round Table Discussion on The Practical Problems of the Pathologist, Dr. Everett L. Bishop, Atlanta, Georgia, Moderator: (a) "Residency Training," Dr. Joe M. Blumberg, Augusta, Georgia; (b) "Income and Outgo," Dr. Walter L. Shepeard, Augusta, Georgia; (c) "Technical Staff," Dr. Alfred Blumberg, Coral Gables, Florida; (d) "Administrative Problems," Dr. Roy R. Kracke, Birmingham, Alabama; and (e) "Postgraduate Study," Dr. Aura J. Miller, Louisville, Kentucky.

Monday, November 14, 6:00 p.m.

Southeastern Section of the College of American Pathologists and the Section on Pathology of the Southern Medical Association met for a Joint Dinner Meeting at the Netherland Plaza Hotel, Parlors A-B-C-D, Cincinnati, Dr. Wiley D. Forbes, Chairman, Durham, North Carolina, presiding.

Dr. Raymond O. Dart, Brigadier General, U. S. Army, and Director, Armed Forces Institute of Pathology, Washington, D. C., read a paper entitled "The Pathologist's Position in the Government Services."

Mr. James A. Hamilton, Minneapolis, Minnesota, read a paper entitled "The Hospital Administrator's View of the Relation Between the Pathologist and the Hospital."

There was a good attendance at both the morning and evening sessions.

Tuesday, November 15, 9:00 a.m.

The Southeastern Section met conjointly with the Section on Pathology of the Southern Medical Association at the Netherland Plaza Hotel, Pavillon Caprice, Cincinnati. (See page 364 for minutes of the Section on Pathology).

WOMAN'S AUXILIARY TO THE SOUTHERN MEDICAL ASSOCIATION

Officers

President—Mrs. Joseph W. Kelso, Oklahoma City, Oklahoma.
President-Elect—Mrs. Robert C. Haynes, Marshall, Missouri.
First Vice-President—Mrs. R. F. Stover, Miami, Florida.
Second Vice-President—Mrs. U. G. McClure, Charleston, West Virginia.
Recording Secretary—Mrs. David F. Adcock, Columbia, South Carolina.
Corresponding Secretary—Mrs. Neil W. Woodward, Oklahoma City, Oklahoma.
Treasurer—Mrs. Stanley A. Hill, Corinth, Mississippi.
Parliamentarian—Mrs. Olin S. Cofer, Atlanta, Georgia.
Historian—Mrs. L. S. Thompson, Dallas, Texas.

Chairmen of Standing Committees—
Research and Romance of Medicine—Mrs. Mason I. Lowance, Atlanta, Georgia.
Custodian of Records—Mrs. E. Latane Flanagan, Richmond, Virginia.
Post Graduate Loan—Mrs. J. Ullman Reaves, Mobile, Alabama.
Budget—Mrs. James A. Ryan, Covington, Kentucky.
Memorial—Mrs. W. K. West, Oklahoma City, Oklahoma.
Doctors Day—Mrs. V. Eugene Holcombe, Charleston, West Virginia.
Jane Todd Crawford Memorial—Mrs. H. E. Christenberry, Knoxville, Tennessee.
Revisions and Resolutions—Mrs. Arthur A. Herold, Shreveport, Louisiana.

The twenty-fifth annual meeting (Silver Anniversary) of the Woman's Auxiliary to the Southern Medical Association was held in Cincinnati, November 14-16, with the Sinton Hotel as headquarters.

Tuesday, November 15, 8:00 a.m.

The Executive Board met for breakfast at the Sinton Hotel, Parlor Five, the President, Mrs. Joseph W. Kelso, presiding. There were thirty-eight present.

Mrs. V. Eugene Holcombe, Past President, Woman's Auxiliary to the American Medical Association, Charleston, West Virginia, gave the invocation.

Dr. Oscar B. Hunter, President of the Southern Medical Association, Washington, D. C., brought greetings.

In the absence of the Recording Secretary, Mrs. David F. Adcock, Columbia, South Carolina, the Treasurer, Mrs. Stanley A. Hill, Corinth, Mississippi, acted as Recording Secretary.

The following recommendations were made: (1) that the Custodian of Records be appointed for a period of five years, also that we send for the records from the Filson Club to be placed with the Custodian; (2) that Mrs. C. P. Loranz be made an honorary member of the Woman's Auxiliary to the Southern Medical Association; (3) that a chairman be appointed to investigate at this meeting the securing of a President's pin; (4) that the red carnation be adopted as the official flower for Doctors Day; and (5) that inasmuch as the original cabin in which Dr. Ephraim McDowell performed the first ovariotomy in history with Jane Todd Crawford as his patient, is now being restored as a shrine in his memory, the Woman's Auxiliary to the Southern Medical Association assembled this November 15, 1949, donate from the Jane Todd Crawford Memorial Fund one thousand dollars ($1,000.00) or such part of that amount as is needed to furnish a room in this cabin in memory of Jane Todd Crawford, such money to be expended under the authority of a committee of three members of this Auxiliary appointed by the President.

The following Nominating Committee was elected, the President naming the Chairman: Mrs. W. A. Selman, Atlanta, Georgia, Chairman, Mrs. Harry M. Gilkey, Kansas City, Missouri, Mrs. Harvey F. Garrison, Sr., Jackson, Mississippi, Mrs. W. W. Potter, Knoxville, Tennessee, and Mrs. James A. Ryan, Covington, Kentucky.

The President appointed the following committees: Auditing, Mrs. John W. Turner, Atlanta, Georgia, and Mrs. L. W. Williams, Savannah, Georgia; President's Pin, Mrs. V. Eugene Holcombe, Charleston, West Virginia, and Mrs. Harry M. Gilkey, Kansas City, Missouri; and Reading, Mrs. John J. O'Connell, St. Louis, Missouri, and Mrs. Wilbur M. Salter, Anniston, Alabama.

Flowers were sent to Dr. Seale Harris, Birmingham, Alabama, who was hospitalized due to injuries suffered in an accident; and a telegram was sent to Mrs. H. Leslie Moore, Dallas, Texas, a loyal and faithful member of the Auxiliary.

After appreciation was expressed by Mrs. Olin S. Cofer, Past President to the Woman's Auxiliary to the Southern Medical Association, to the President of the Auxiliary, Mrs. Joseph W. Kelso, Oklahoma City, Oklahoma, and to the Chairman of Arrangements, Mrs. Oscar W. Frickman, Newport, Kentucky, the meeting adjourned.

Tuesday, November 15, 10:00 a.m.

The Auxiliary met in the Sinton Hotel, Rookwood Room, and was called to order by the President, Mrs. Joseph W. Kelso, who presided.

Mrs. W. K. West, Past President, Woman's Auxiliary to the Southern Medical Association, Oklahoma City, Oklahoma, gave the invocation.

Addresses of welcome were given by Mrs. Oscar W. Frickman, Chairman of Committee for Visiting Ladies, Fort Thomas, Kentucky, and Mrs. E. W. Jackson, President, Woman's Auxiliary to the Kentucky State Medical Association, Paducah, Kentucky. Mrs. Oscar B. Hunter, Washington, D. C., responded to the addresses of welcome.

The Pages, Mrs. Paul E. Muncy, Mrs. Carl W. Kumpe and Mrs. William J. Temple, all of Covington, Kentucky, and Mrs. Arthur F. Schultz, Newport, Kentucky, were introduced by the Chairman, Mrs. James F. McMurry, Sentinel, Oklahoma.

Among those present and introduced by the President, Mrs. Kelso, were Mrs. Robert C. Haynes, President-Elect, Woman's Auxiliary to the Southern Medical Association, Marshall, Missouri; Mrs. David B. Allman, President, Woman's Auxiliary to the American Medical Association, Atlantic City, New Jersey; Mrs. Arthur A. Herold, President-Elect, Woman's Auxiliary to the American Medical Association and Past President, Woman's Auxiliary to the Southern Medical Association, Shreveport, Louisiana. Also presented were the Past Presidents of the Woman's Auxiliary to the American Medical Association, Past Presidents and Charter Members of Woman's Auxiliary to the Southern Medical Association, the five charter members being Mrs. Olin S. Cofer, Atlanta, Georgia; Mrs. W. A. Selman, Atlanta, Georgia; Mrs. Charles P. Corn, Greenville, South Carolina; Mrs. Harvey F. Garrison, Sr., Jackson, Mississippi; and Mrs. J. Ullman Reaves, Mobile, Alabama.

Telegrams were read from Mrs. David F. Adcock, Recording Secretary, Columbia, South Carolina, and Mrs. Neil W. Woodward, Corresponding Secretary, Oklahoma City, Oklahoma, expressing regrets for their inability to be present.

Reflections and Memories, written by Dr. Seale Harris, Birmingham, Alabama, were read, and a moment of silent prayer was offered for his recovery. The late Mrs. Seale Harris organized the Woman's Auxiliary to the Southern Medical Association at the New Orleans meeting in November 1924.

There were 215 registered from 20 states as reported by Chairman of Registration, Mrs. E. E. DeVillez, Covington, Kentucky.

Recommendations from the Executive Board were read and approved.

Reports from the officers were given and approved.

The minutes of the Miami meeting (1948) were approved as printed in the Southern Medical Journal, March 1949.

The President, Mrs. Kelso, was thanked for the report of her year's work which was outstanding.

An impressive Memorial Service was conducted by Mrs. W. K. West, Past President, Woman's Auxiliary to the Southern Medical Association, Oklahoma City, Oklahoma.

The meeting then adjourned.

Wednesday, November 16, 9:30 a.m.

The Auxiliary met in the Sinton Hotel, Parlor Five, the President, Mrs. Joseph W. Kelso, presiding.

Mrs. W. A. Selman, Atlanta, Georgia, gave the invocation.

The minutes of the Tuesday Session of the Auxiliary were read and approved.

Reports of Standing Committees were read and approved: (1) Mrs. Mason I. Lowance, Chairman of Research and Romance of Medicine, Atlanta, Georgia, recommended that the chairmanship carry a three-year term, the work to be planned ahead on a three-year basis with a chairman-elect coming in as a co-chairman during the third year, the recommendation being adopted; (2) Mrs. V. Eugene Holcombe, Chairman of Doctors Day, Charleston, West Virginia, presented awards: first to Lafayette County, Oxford, Mississippi, $10.00; second to Fulton County, Atlanta, Georgia, scrapbook; third to Kanawha County, Charleston, West Virginia, scrapbook; and honorable mention to Danville (Virginia) and Kentucky. Scrapbooks were also presented to Mrs. Joseph W. Kelso and Mrs. Robert C. Haynes. It was moved and carried that a letter of appreciation be sent to each county for the work done on the Doctors Day Contest.

Reports of State Councilors were read and approved.

Total registration was 301.

Mrs. Louis K. Hundley, President, Woman's Auxiliary to the Arkansas Medical Society, Pine Bluff, Arkansas, reported on the Convention of the Woman's Auxiliary to the American Medical Association held in Atlantic City in June.

Mrs. John W. Turner, Chairman, Auditing Committee, Atlanta, Georgia, reported that the Treasurer's books were found to be correct.

Mrs. Walker Owens, Chairman, Courtesy Resolutions, Mt. Vernon, Kentucky, read resolutions of appreciation to the host medical society, the Campbell-Kenton County Medical Society of Kentucky, which were approved and the Secretary instructed to send copy to the Society.

Mrs. W. A. Selman, Chairman, Nominating Committee, Atlanta, Georgia, presented the following report, the nominees being unanimously elected: President, Mrs. Robert C. Haynes, Marshall, Missouri; President-Elect, Mrs. L. S. Thompson, Dallas, Texas; First

Vice-President, Mrs. V. Eugene Holcombe, Charleston, West Virginia; Second Vice-President, Mrs. A. L. O'Briant, Raeford, North Carolina; Recording Secretary, Mrs. Stanley A. Hill, Corinth, Mississippi; Corresponding Secretary, Mrs. W. E. Martin, Odessa, Missouri; Treasurer, Mrs. James A. Ryan, Covington, Kentucky; Historian, Mrs. R. F. Stover, Miami, Florida; and Parliamentarian, Mrs. Joseph W. Kelso, Oklahoma City, Oklahoma, the newly elected officers being installed by Mrs. M. Pinson Neal, Past President, Woman's Auxiliary to the Southern Medical Association, Columbia, Missouri.

Mrs. Joseph W. Kelso, retiring President, presented the gavel to the incoming President, Mrs. Robert C. Haynes, Marshall, Missouri.

The annual meeting then adjourned.

Wednesday, November 16, 1:00 p.m.

The Auxiliary met for its twenty-fifth annual luncheon honoring the Charter Members and Past Presidents at the Sinton Hotel, Rookwood Room, the President, Mrs. Joseph W. Kelso, presiding.

Mrs. W. W. Potter, Past President, Woman's Auxiliary to the Southern Medical Association, Knoxville, Tennessee, gave the invocation.

The President, Mrs. Kelso, introduced the officers, board members and distinguished guests.

Mrs. L. S. Thompson, Historian and President-Elect, Woman's Auxiliary to the Southern Medical Association, Dallas, Texas, read the history of the twenty-five years of the Auxiliary, its activities and accomplishments.

Dr. Elmer L. Henderson, Past President, Southern Medical Association, and President-Elect, American Medical Association, Louisville, Kentucky, spoke on socialized medicine as observed in other countries, noting the marked deterioration within a two-year period in England. He challenged Americans to awaken to the effort being made for political medicine and stressed the great aid that the women of the Auxiliary can now be in public relations.

Mr. C. P. Loranz, Secretary-Manager, Southern Medical Association, Birmingham, Alabama, spoke briefly.

Mrs. Arthur A. Herold, Past President, Woman's Auxiliary to the Southern Medical Association, and President-Elect to the Woman's Auxiliary to the American Medical Association, Shreveport, Louisiana, introduced Mrs. David B. Allman, President, Woman's Auxiliary to the American Medical Association, Atlantic City, New Jersey, who brought greetings from the Woman's Auxiliary to the American Medical Association, stressing the American way of life and asking each member to do her part in furthering the aims of the Auxiliary.

Mrs. Oscar W. Frickman, Chairman for Visiting Ladies, Fort Thomas, Kentucky, introduced the members of her committees, and Mrs. Kelso, on behalf of the Auxiliary, expressed gratitude and appreciation.

The Auxiliary then adjourned.

Thursday, November 17, 8:30 a.m.

The Executive Board, post-convention meeting, met at a breakfast at the Sinton Hotel, Parlor Five, the President, Mrs. Robert C. Haynes, Marshall, Missouri, presiding. There were twenty-six present.

Mrs. Olin S. Cofer, Past President, Woman's Auxiliary to the Southern Medical Association, Atlanta, Georgia, gave the invocation.

The President, Mrs. Haynes, extended welcome and introduced the guests.

Dr. Hamilton W. McKay, President, Southern Medical Association, Charlotte, North Carolina, expressed his desire to create more interest in social functions at the meetings; also his conviction that the younger physicians should take a more active part in the Association.

Dr. F. A. Holden, Baltimore, Maryland, Vice-Chairman of the Executive Committee of the Council of the Southern Medical Association, which is the Advisory Committee to the Auxiliary, spoke briefly.

Mr. C. P. Loranz, Secretary-Manager of the Southern Medical Association, Birmingham, Alabama, spoke briefly.

Mrs. David B. Allman, President, Woman's Auxiliary to the American Medical Association, Atlantic City, New Jersey, and Mrs. Arthur A. Herold, Past President, Woman's Auxiliary to the Southern Medical Association and President-Elect, Woman's Auxiliary to the American Medical Association, Shreveport, Louisiana, were also guests.

The Board voted to combine the Committees, Jane Todd Crawford Memorial and Post Graduate Loan, the new committee to be known as the Jane Todd Crawford Memorial Loan Scholarship Fund; and authorized the President to appoint a committee to sort, revise and condense the records of the Auxiliary. The budget for the ensuing year was approved by the Board.

The Board commended Mrs. Kelso upon her successful year, and earnest cooperation was pledged to the incoming President, Mrs. Haynes.

The President, Mrs. Haynes, announced the following Chairmen of Standing Committees (all are members of the Executive Board):

Budget—Mrs. E. Latane Flanagan, Richmond, Virginia.

Custodian of Records—Mrs. W. W. Potter, Knoxville, Tennessee.

Jane Todd Crawford Memorial Loan Scholarship Fund—Mrs. J. Ullman Reaves, Mobile, Alabama.

Doctors Day—Mrs. Neil W. Woodward, Oklahoma City, Oklahoma.

Memorial—Mrs. M. Pinson Neal, Columbia, Missouri.

Research and Romance of Medicine—Mrs. David F. Adcock, Columbia, South Carolina.

Resolutions—Mrs. Richard H. Clark, Hattiesburg, Mississippi.

Revisions—Mrs. L. M. Jenkins, Miami, Florida.

The President, Mrs. Haynes, announced the appointment of councilors for a term of three years to expire 1952.

Council, Woman's Auxiliary to the Southern Medical Association

(All are Members of the Executive Board)

Expire 1950—
Alabama—Mrs. Wilbur M. Salter, Anniston.
Arkansas—Mrs. Louis K. Hundley, Pine Bluff.
District of Columbia—Mrs. J. H. Bullock, Washington.
Florida—Mrs. C. D. Rollins, Jacksonville.
Georgia—Mrs. John W. Turner, Atlanta.

Expire 1951—
Kentucky—Mrs. Walter Owens, Mt. Vernon.
Louisiana—Mrs. George D. Feldner, New Orleans.
Maryland—Mrs. Thomas A. Christensen, College Park.
Mississippi—Mrs. Harvey F. Garrison, Sr., Jackson.
Missouri—Mrs. John J. O'Connell, St. Louis.
North Carolina—Mrs. Clyde Hedrick, Lenoir.
Oklahoma—Mrs. Ray M. Balyeat, Oklahoma City.

Expire 1952—
South Carolina—Mrs. J. L. Sanders, Greenville.
Tennessee—Mrs. H. E. Christenberry, Knoxville.
Texas—Mrs. Fred W. Horn, Dallas.
Virginia—Mrs. W. R. Payne, Hampton.
West Virginia—Mrs. U. G. McClure, Charleston.

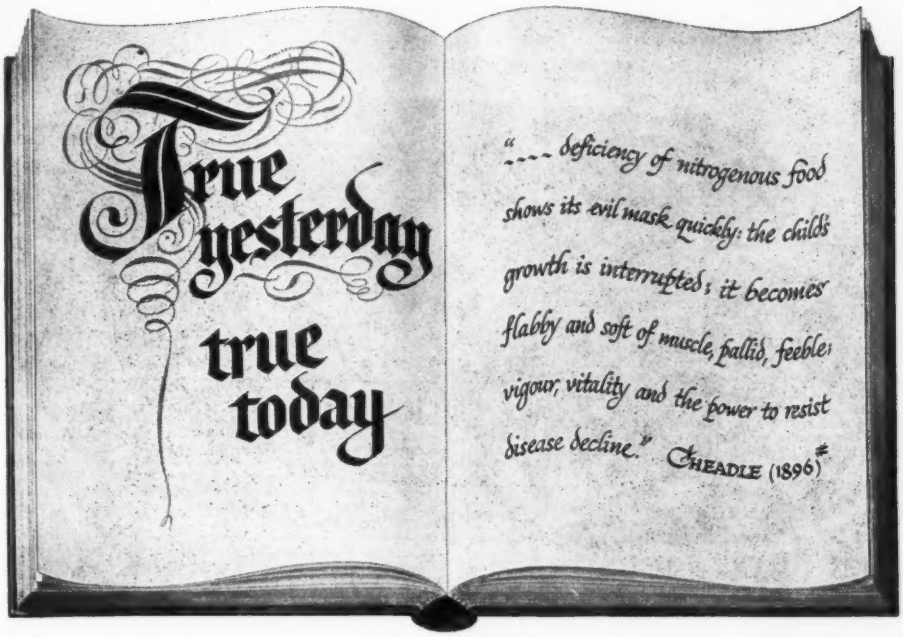
Living Past Presidents, Woman's Auxiliary to the Southern Medical Association

(All are Members of the Executive Board)

1925, Mrs. E. H. Cary, Dallas, Texas.
1927, Mrs. Oscar M. Marchman, Dallas, Texas.
1928, Mrs. Arthur T. McCormack, Louisville, Kentucky.
1929, Mrs. C. W. Garrison, Little Rock, Arkansas.
1930, Mrs. James N. Brawner, Sr., Atlanta, Georgia.
1931, Mrs. S. A. Colliom, Sr., Texarkana, Texas.
1932, Mrs. Chas. E. Oates, Little Rock, Arkansas.
1933, Mrs. Arthur A. Herold, Shreveport, Louisiana.
1936, Mrs. Oliver W. Hill, Sr., Knoxville, Tennessee.
1937, Mrs. Frank N. Haggard, San Antonio, Texas.
1938, Mrs. Luther Bach, Florence, Kentucky.
1939, Mrs. W. K. West, Oklahoma City, Oklahoma.
1940, Mrs. Charles P. Corn, Greenville, South Carolina.
1941, Mrs. M. Pinson Neal, Columbia, Missouri.
1942, Mrs. J. Ullman Reaves, Mobile, Alabama.
1943, Mrs. Richard H. Clark, Hattiesburg, Mississippi.
1944-1945, Mrs. John Pierpont Helmick, Fairmont, West Virginia.
1946, Mrs. W. W. Potter, Knoxville, Tennessee.
1947, Mrs. Wiley R. Buffington, New Orleans, Louisiana.
1948, Mrs. Olin S. Cofer, Atlanta, Georgia.
1949, Mrs. Joseph W. Kelso, Oklahoma City, Oklahoma.

Advisory Committee

The Advisory Committee to the Woman's Auxiliary is the Executive Committee of the Council of the Southern Medical Association: Dr. W. L. Pressly, Chairman, Due West, South Carolina; Dr. F. A. Holden, Vice-Chairman, Baltimore, Maryland; Dr. W. L. Sanders, Memphis, Tennessee; and ex-officio members, Dr. Hamilton W. McKay, President, Southern Medical Association, Charlotte, North Carolina, and Dr. Curtice Rosser, President-Elect, Dallas, Texas.


True yesterday
true today
"---- deficiency of nitrogenous food shows its evil mask quickly: the child's growth is interrupted; it becomes flabby and soft of muscle, pallid, feeble; vigour, vitality and the power to resist disease decline." CHEADLE (1896)#

Today, OLAC formulas for infants assure generous protein intake

Dr. Cheadle's words, quoted above, reveal an understanding of nutrition years ahead of his time. Physicians now recognize not only the baleful effects of protein deficiency but the many advantages of optimum protein nutrition.

OLAC* is Mead's high protein food designed for both premature and full term infants. Fed in the recommended amounts, it provides more protein than the Recommended Daily Allowance of the National Research Council.

The two carbohydrates in OLAC are Dextri-Maltose* and lactose. A highly refined vegetable oil is used in place of milk fat.

The preparation of OLAC formulas is simplicity itself; only water need be added. Formula tables are available on request.

#Cheadle, W. B.: Artificial Feeding of Infants, 1896; Cited by Clements, A. D.: M. J. Australia 2:404, 1946.

*T. M. Reg. U. S. Pat. Off.

Continued from page 360

of Pediatrics, University of Louisville, will not be conducted this year due to the new Children's Hospital which is now in progress. The course will be resumed next spring.

LOUISIANA

American Association of Anatomists will meet in New Orleans, April 3-5.

American Academy of Orthopaedic Surgeons has installed Dr. Guy A. Caldwell, New Orleans, President; Dr. Joseph S. Barr, Boston, Massachusetts, President-Elect; Dr. Harold B. Boyd, Memphis, Tennessee, Secretary; and Dr. H. Relton McCarroll, St. Louis, Missouri, Treasurer.

Louisiana Society of Anesthesiologists has elected Dr. John Adriani, New Orleans, President; Dr. John W. McGehee, Baton Rouge, Vice-President; and Dr. A. J. Ochsner, New Orleans, Secretary-Treasurer.

Dr. Charles Sheard, former Director, Division of Biophysical Research, Mayo Clinic, Rochester, Minnesota, has been appointed Professor of Ophthalmology, Tulane University School of Medicine, New Orleans, Louisiana.

A joint clinic for cancer research, supported by Tulane University School of Medicine, the Ochsner Medical Foundation, and the American Cancer Society, was opened the early part of the year at 3507 Prytania Street, New Orleans. Headed by Dr. Albert Segaloff, Assistant Professor of Medicine, Tulane University School of Medicine, and Director of Endocrine Research at the Foundation, the clinic was constructed at the expense of Ochsner Clinic to house the expanding research program made possible by grants to Tulane and the Foundation.

MARYLAND

Society of American Bacteriologists has elected Dr. Barnett Cohen (Ph.D.) Johns Hopkins University School of Medicine, Baltimore, President; and John E. Blair, Hospital for Joint Diseases, New York City, Secretary-Treasurer.

Dr. Paul V. Lemkau, Associate Professor of Public Health Administration, has been appointed Chief of the Division of Mental Hygiene of the Maryland State Department of Health.

Sydenham Hospital, communicable disease hospital for Baltimore in Montebello, has been closed. The new Sydenham Service has been set up in Baltimore City Hospital under the direction of Dr. Harold E. Harrison, Chief of the Pediatric Division of the hospital. The state appropriation of over $250,000 per year for a 100-bed institution that was three-quarters empty the year round on the average was deemed unwise.

MISSISSIPPI

University of Tennessee College of Medicine, Memphis, Tennessee, is conducting conferences in six northern Mississippi cities to help practicing physicians diagnose cancer, the conferences sponsored by the Mississippi Chapter of the American Cancer Society and the Mississippi State Medical Association with the cooperation of the University of Mississippi. Place and date of conferences held: Columbus, February 1-8; Tupelo, March 2-9; Oxford, March 16-23; Clarksdale, March 30-April 6. To be held: Grenada, April 12-19; and Greenwood, April 26-May 3.

Continued on page 66

Classified Advertisements

INTERNSHIP or general residency available at City Hospital, Brunswick, Georgia. 100 bed capacity with provisional ACS approval. Full maintenance plus $200.00 per month salary.

FOR SALE—long established hospital in South Georgia. Surgeon in charge retiring. Well equipped and fully accredited by College of Surgeons. Nurses home and doctors' apartments joining hospital. Contact TC, c/o SMJ.

RESIDENTS—two, general, Florida County Hospital. Actual surgery experience available. Salary and maintenance. Contact GEH, c/o SMJ.

PHYSICIAN RETIRING—wants to sell surgical instruments and entire office equipment including roller-top desk and chairs; wicker settee with two rockers; also, beautiful living room table; radio, typewriter and metal stand; operating table and metal stool. Will sell at great sacrifice. Contact CM, c/o SMJ.

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A three year course, beginning in October, fulfilling all the requirements of the American Board of Dermatology and Syphilology.

SYMPOSIUM FOR SPECIALISTS

A full-time course of five days' duration. A review of recent advances in Dermatology and Syphilology, consisting of lectures and demonstrations; discussion of the rarer dermatoses with lantern slide illustrations.

UROLOGY

A combined full-time course in Urology, covering an academic year (8 months). It comprises instruction in pharmacology; physiology; embryology; biochemistry; bacteriology and pathology; practical work in surgical anatomy and urological operative procedures on the cadaver; regional and general anesthesia (cadaver); office gynecology; proctological diagnosis; the use of the ophthalmoscope; physical diagnosis; roentgenological interpretation; electrocardiographic interpretation; dermatology and syphilology; neurology; physical medicine; continuous instruction in cysto-endoscopic diagnosis and operative instrumental manipulation; operative surgical clinics; demonstrations in the operative instrumental management of bladder tumors and other vesicle lesions as well as endoscopic prostatic resection.

SYMPOSIUM ON DERMATOPATHOLOGY

A full-time course of five days' duration comprised of didactic lectures, microprojection of illustrative material and study of microscopic slides under supervision.

SYMPOSIUM FOR GENERAL PRACTITIONERS

A full-time course of five days' duration. A review of recent advances in the diagnosis and treatment of the more common disorders of the skin, including syphilis, comprising lectures, lantern slide demonstrations, presentation of cases and histopathological material.

EYE, EAR, NOSE AND THROAT

A combined full-time course covering an academic year (9 months). It consists of attendance at clinics, witnessing operations, lectures, demonstration of cases and cadaver demonstrations; operative eye, ear, nose and throat on the cadaver; head and neck dissection (cadaver); clinical and cadaver demonstrations in bronchoscopy, laryngeal surgery and surgery for facial palsy; refraction, radiology; pathology; bacteriology; embryology; physiology, neuro-anatomy; anesthesia; physical medicine; allergy; examination of patients preoperatively and follow-up postoperatively in the wards and clinics. Also refresher courses (3 months).

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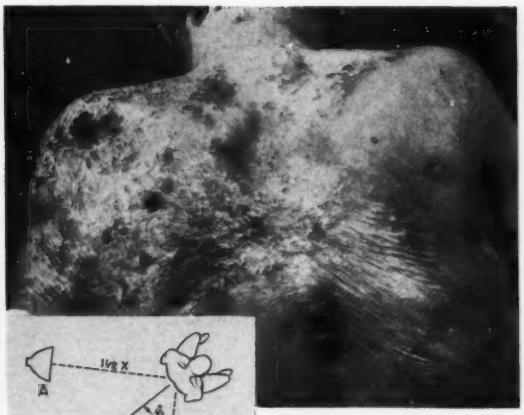
ABOVE: *Blastomycosis, with heavy skin involvement.* UPPER RIGHT: *Control of infection after treatment.*



Two Kodak Vari-Beam Standlights are arranged as indicated above. Light A is at camera level; light B is 24" higher than the camera.

Picture the patient

...from initial diagnosis to final discharge

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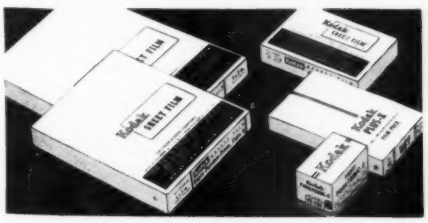

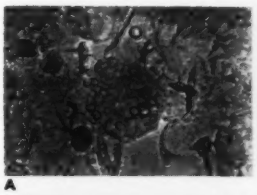
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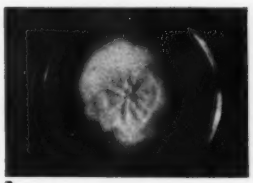
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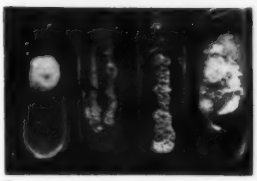
C

BLASTOMYCES DERMATITIDIS: **A**—*Budding cells in pus.* (*Photomicrograph.*) **B**—*Giant colony in Sabouraud's agar.* **C**—*Growth of test tube cultures on two different media at room and body temperatures.*

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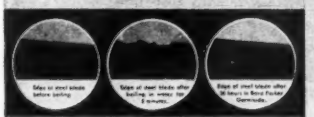

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Continued from page 62

Dr. J. S. Sanders, Leland, recently received his Fifty-Year certificate and pin for having served fifty years in the practice of medicine.

Dr. E. W. Eberling announces the opening of the Clinic for Children at Starkville.

MISSOURI

Dr. Melvin A. Casberg, St. Louis, was elected recently to the Board of Directors, National Society for Medical Research.

Dr. Burford G. Hamilton, Richmond, has been appointed Director, Missouri Division of Health, replacing the late Dr. D. F. Adams, who was Acting Director.

NORTH CAROLINA

Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, has announced the following appointments: Dr. R. Winston Roberts, Jr., Assistant Professor of Surgery in charge of ophthalmology, formerly Instructor in Ophthalmology; and Marjorie A. Swanson (Ph.D.), Assistant Professor of Biochemistry.

North Carolina Medical Care Commission has approved sixty-eight separate hospital construction projects in the last two and one-half years, providing North Carolinians with 3,134 new beds for patients and 1,048 new beds for nurses and the four health centers at an estimated cost of $33,127,954 in federal, state and local funds. Two hospitals have been completed, a 42-bed in Ahoskie, and one of 20 beds in Belhaven. A 22-bed nurses' home at Ahoskie is also finished. Ten of the 68 projects are nearing completion.

Dr. Henry T. Clark, Jr., Medical Director, Vanderbilt University Hospital, Nashville, Tennessee, has been appointed Administrator of the Division of Medical Affairs of the University of North Carolina School of Medicine, Chapel Hill, effective May 1. He will head the new division of the university that includes five health professional schools and the hospital.

An $8,000 addition is being built on the fifth floor of the Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, to house offices and laboratories of the Department of Neuropsychiatry.

Dr. Jerry K. Aikawa, Department of Medicine, Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, is one of 34 scientists who recently received research fellowships from the American Heart Association. The grant-in-aid, amounting to $3,000, will be used for research in rheumatic fever.

Dr. Donald S. Martin, for eighteen years a member of the Duke University Medical School and Duke Hospital staffs, has resigned to become Dean and Professor of Microbiology at the newly-established University of Puerto Rico School of Medicine, San Juan, assuming duties about April 1. The new medical school in Puerto Rico will open its doors next fall.

North Carolina Tuberculosis Association will hold its next annual meeting in Durham, May 22 and 23.

Dr. Norman Boyer has opened an office in Scotland Neck for the practice of medicine.

Dr. Howard T. Holden has moved from Asheboro to Charlotte and opened offices for the practice of ophthalmology and otolaryngology.

OKLAHOMA

Dr. John E. McDonald, Tulsa, has been appointed a member of the Public Policy Committee to fill vacancy created by the resignation of Dr. C. G. Stuard, Tulsa. Dr. McDonald is immediate past president of Tulsa County Medical Society and has taken an active part in the public relations work at Tulsa.

Dr. John H. Lamb, Oklahoma City, was recently named to the American Board of Dermatology and Syphilology at the American Academy of Dermatology and Syphilology meeting.

Oklahoma Advisory Health Council at its annual meeting elected Dr. Robert Cavins, Ardmore, President-Elect; and Dr. E. Harold Hinman, Norman, Secretary-Treasurer. Dr. Joe McBride, Anadarko, was installed President.

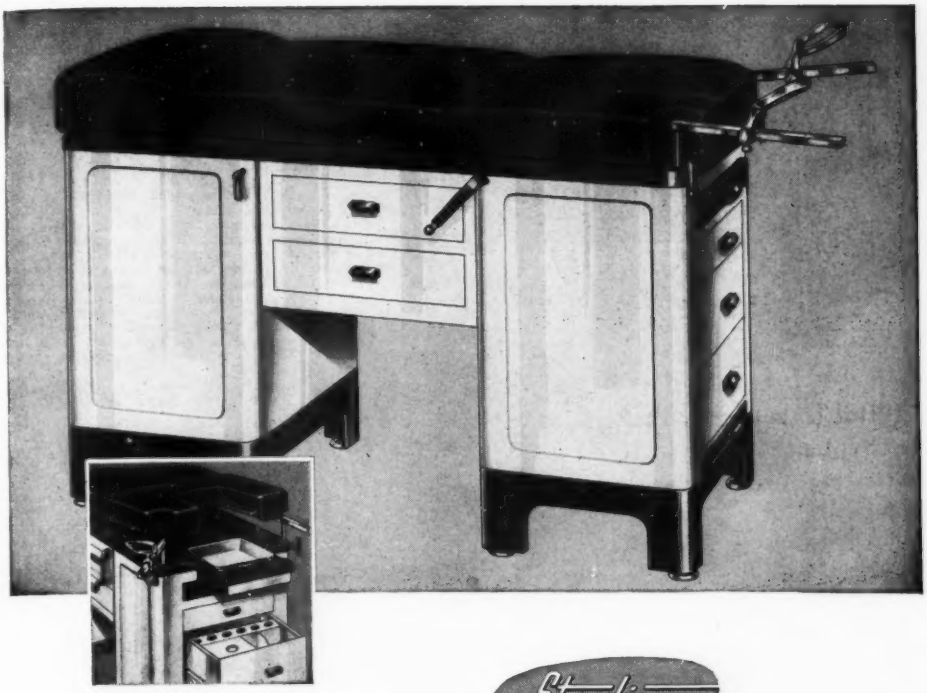
The Oklahoma Medical Research Foundation, a three-story building with 56 laboratory units, an animal wing and administration offices, is expected to be ready for occupancy in June or July. This building is located just east of the Medical School in Oklahoma City. Construction on a 22-bed research hospital, scheduled to begin in May or June, and made possible through receipt of grants for $225,000 from the National Heart Institute, and the National Cancer Institute, will not be ready for operation for approximately a year.

Masonic Hospital, Cushing, has the newly elected officers: Dr. E. O. Martin, Chief of Staff; Dr. John W. Martin, Vice-President; and Dr. J. D. Martin, Secretary-Treasurer, reelected.

Dr. H. K. Speed, Sayre, has been named to the Board of Directors of the local Chamber of Commerce.

Oklahoma State Heart Association was formed recently and Dr. Homer A. Ruprecht, Tulsa, was elected President; Dr. W. W. Rucks, Jr., Oklahoma City, Vice-President; Dr. Robert H. Bayley, Oklahoma City, Secretary; and Dr. Wann Langston, Oklahoma City, Chairman of the Board.

Continued on page 68



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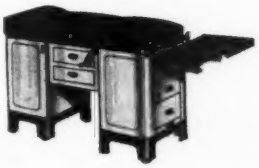

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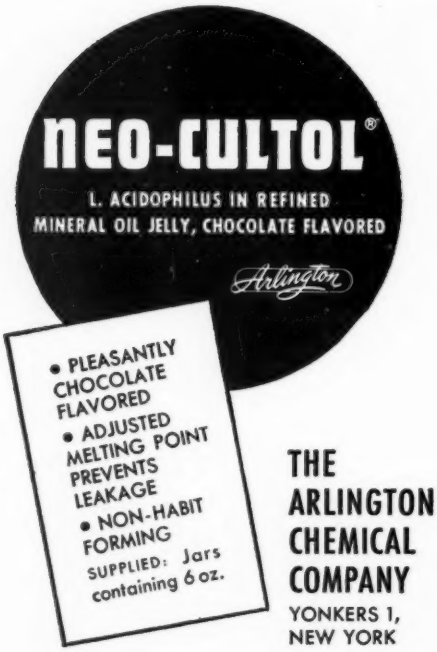

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Continued from page 66

SOUTH CAROLINA

South Carolina Medical Association will hold its next annual meeting at Myrtle Beach, Ocean Forest Hotel, May 16-18.

Dr. C. A. Kinney has opened an office in Bennettsville for the practice of general surgery.

Dr. Chapin Hawley is associated with Dr. Thomas Pitts, Columbia, in the practice of radiology at the Baptist Hospital.

Dr. Henry W. Moore, Columbia, has been certified by the American Board of Pediatrics.

Dr. John Timmons, Columbia, has been certified by the American Board of Surgery.

Dr. George R. Laub, Columbia, was recently elected Associate Fellow of the American College of Allergy.

Dr. C. L. Guyton, Columbia, has joined the Medical Staff of the Veterans Administration Regional Office at Fort Jackson.

Dr. Albert Cannon, who was graduated from the Medical College of South Carolina, Charleston, now an interne at George Washington University Hospital, Washington, D. C., has been chosen the "man of the year" for his outstanding contribution to the surgical service and his popularity among his co-workers, the award being a two-week visit to observe techniques at the Mayo Clinic under the sponsorship of the surgical staff of the George Washington University Hospital. The honoree each year selects the clinic he will visit, the one most beneficial in his line of work.

Dr. Charles B. Preacher, Jr., State Park, and Miss Ava Thelma Moore, Fort Davis, Alabama, were married recently.

TENNESSEE

University of Tennessee, Memphis, has received grants from the American Cancer Society totaling $16,415 to finance research. The four members of the faculty who will conduct this research are Dr. Donald B. Zilversmit for the study of the "role of phospholipids in fat utilization"; Dr. Lester Van Middlesworth, "role of radioactive cysteine in healing trauma"; Dr. R. R. Alden, "the development and growth characteristics (cytological and histochemical) of trophoblast tissue in the rat"; and Dr. John L. Wood, "role of sulfur compounds in the intermediary metabolism of aromatic hydrocarbons."

Dr. Harold B. Boyd, Memphis, has been elected Secretary of the American Academy of Orthopaedic Surgeons.

Continued on page 70

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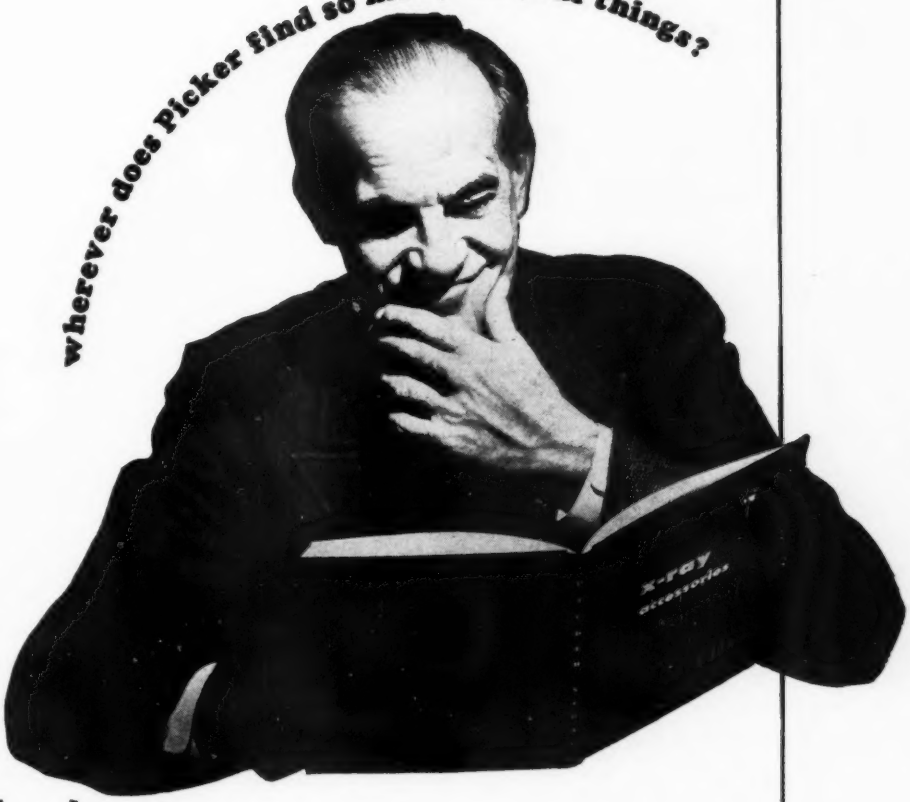

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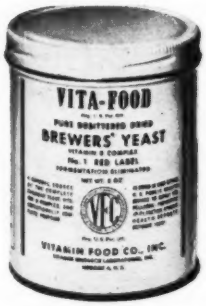

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Continued from page 68

Dr. Glen W. Doolen, Chief of Tuberculosis Section, Veterans Administration, Washington, D. C., Area Medical Office, recently became Manager of the Veterans Administration Hospital in Memphis, succeeding Dr. Franklin C. Cassidy, who has been transferred to the Office of the Area Medical Director, San Francisco, California.

Association for Physical and Mental Rehabilitation will hold its fourth annual meeting in Memphis, Hotel Peabody, May 23-27. Mr. Clements G. McNamara, Kennedy Veterans Administration Hospital, Memphis, is local Chairman.

Southwest Allergy Forum will hold its annual meeting in Memphis, April 2-4.

TEXAS

Ten organizations related to the State Medical Association of Texas will meet in Fort Worth, April 30-May 1, prior to the opening of the State meeting on May 2, the Texas Air-Medics Association, Texas Chapter of the American College of Chest Physicians, Texas Dermatological Society, Texas Diabetes Association, Texas Heart Association, Texas Orthopedic Association, Texas Railway and Traumatic Surgical Association, Texas Society of Anesthesiologists, Texas Society of Gastroenterologists and Proctologists, and Conference of City and County Health Officers.

Dr. Joel R. McGee, New Boston, was presented on January 22 the first General Practitioner's Award of the State Medical Association of Texas.

The Midland Memorial Fund for the Midland Memorial Hospital, Midland, has received a gift of $50,000 from the J. E. and L. E. Mabee Foundation, Inc., Tulsa, Oklahoma.

The new $42,000 Lubbock Cerebral Palsy Treatment Center is under construction. The Lubbock Rotary Club is co-sponsor for the project.

Dr. Arthur J. Schwenkenberg and Dr. Joseph L. Knapp, Dallas psychiatrists, were elected to the Board of Regents of the Southern Psychiatric Association recently. Dr. Schwenkenberg will serve as Chairman of the Board.

Dr. Harold Aronson, Dallas, and Miss Frances M. Cabell were married recently.

Texas Academy of Internal Medicine was formed recently in Dallas with Dr. Samuel A. Shelburne, Dallas, as President; Dr. John S. Chapman, Dallas, was elected Secretary-Treasurer for three years. Annual meetings will rotate through the three cities with medical schools, Dallas, Houston and Galveston. To be eligible for membership a physician must be certified by the American Board of Internal Medicine.

Dr. Herman W. Johnson, Houston, has been appointed first full-time Professor and Chairman of the Department of Obstetrics, Baylor University College of Medicine, Houston.

University of Texas Medical Branch, Galveston, has added to its faculty Dr. Kenneth P. McConnell (Ph.D.) as Assistant Professor of Biochemistry and Nutrition; Dr. Mabel G. Wilkin, Clinical Associate Professor of Psychiatry; and Dr. Ira J. Jackson, Instructor in Neurosurgery.

Dr. E. Ivan Bruce, Jr., Galveston, has been appointed Assistant Administrator of the Galveston State Psychopathic Hospital.

VIRGINIA

Shenandoah County Memorial Hospital, recently constructed near Woodstock, has on the Medical Staff Dr. Harold W. Miller, Woodstock, Chief of the Medical Staff; Dr. J. M. Winkfield, Strasburg, Assistant Chief; Dr. Frank W. Gearing, Jr., Woodstock, Secretary; and Dr. R. W. Stoneburner, Edinburg, and Dr. Edward Hopewell, Strasburg, members of the Executive Committee.

Dr. Augustine W. Tucker, until recently Director, St. Luke's Hospital, Shanghai, China, has been named Resident Physician, Woodberry Forest School.

Dr. Richard B. Wissinger has been named Health Officer of the Alleghany-Botetourt Health District.

Dr. E. D. Hardin has resigned as Health Officer of the Shenandoah-Warren Health District to accept a position with the State Board of Health of North Carolina.

Dr. A. J. Crutchfield has resigned as Assistant Professor of Internal Medicine, University of Virginia School of Medicine, Charlottesville, and has located to practice the specialty of internal medicine at Winston-Salem, North Carolina.

Dr. Jefferson D. Kernodle, formerly Pathologist and Director of the Clinical Laboratory, Alexandria Hospital, Alexandria, has been appointed Instructor in Pathology, Tufts Medical School, Boston, Massachusetts.

Petersburg Hospital, Petersburg, has the newly elected officers on its faculty: Dr. Edith Miller, President; Dr. William Grossman, Vice-President; Dr. Julius Hopkins, Secretary; and Dr. K. J. Moore, Assistant Secretary.

Dr. Virgil R. May, Jr., is associated with Dr. J. B. Dalton and Dr. Wm. Minor Deyerle, Richmond, in the practice of orthopedic surgery.

Waynesboro Community Hospital, Waynesboro, has the newly elected officers on its staff: Dr. C. C. Freed, President; Dr. Paul A. Woods,

Continued on page 72

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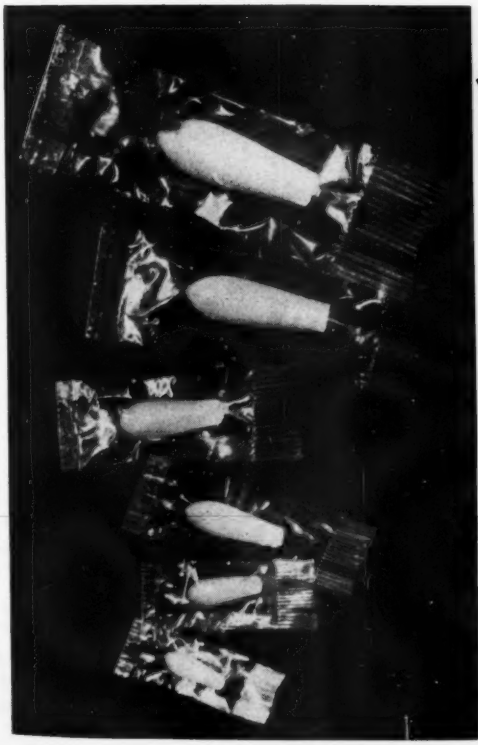

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Continued from page 70

Vice-President; Dr. T. L. Hoyt, Secretary; and Dr. A. M. McLaughlin, Treasurer.

Dr. Frederick D. White and Dr. Houston L. Bell are associated with the Gill Memorial Eye, Ear and Throat Hospital in the Department of Ophthalmology and Otolaryngology.

Dr. E. F. Reese, III, has moved from Franklin to Courtland where he is engaged in general practice with his father, Dr. E. F. Reese, Jr.

Mary Washington Hospital, Fredericksburg, has on its staff the newly elected officers: Dr. James G. Willis, President; and Dr. Lloyd F. Moss, Secretary-Treasurer.

Dr. Richard C. Cecil, Associate Professor in Medicine at Medical College of Virginia, Richmond, since 1944, has joined the staff of McGuire Veterans Hospital, Richmond.

Medical College of Virginia, Richmond, has received a bequest of $400,000 made by Mrs. Wilkins C. Williams which will be used to establish the A. D. Williams Memorial Clinic Foundation as a memorial to Mrs. Williams' husband.

Raiford Memorial Hospital, Franklin, has the newly elected officers on its staff: Dr. Emmett F. Reese, Jr., Courtland, Chief of Staff; Dr. Kurt Hirsch, Franklin, Assistant Chief; and Dr. W. D. Varner, Franklin, Secretary.

Dr. W. Gayle Crutchfield, Charlottesville, was elected First Vice-President of the Southern Surgical Association at its recent meeting.

WEST VIRGINIA

West Virginia Academy of Ophthalmology and Otolaryngology will hold its third annual meeting at White Sulphur Springs, The Greenbrier, May 8-9.

A proposed West Virginia State Diabetes Association will be open to all members of the West Virginia State Medical Association and the initial meeting will probably be held during the annual State meeting at White Sulphur Springs, July 27-29. Physicians interested in membership in this new association should write to Diabetes Committee, Box 1031, Charleston, West Virginia.

The 26th Annual State Health Conference will be held at Wheeling, McLure Hotel, May 4-5.

Dr. Milford F. Townsend has moved from Dailey to Petersburg.

Dr. Joseph T. Peters, South Charleston, has assumed duties as member of the Medical Staff of the Carbide and Carbon Chemicals Corporation in South Charleston.

Dr. C. W. Vick, Jenkinjones, has retired after fifty years of active practice and has moved to Bluefield.

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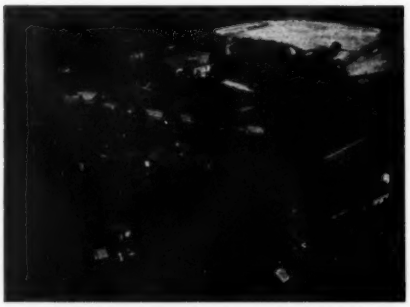

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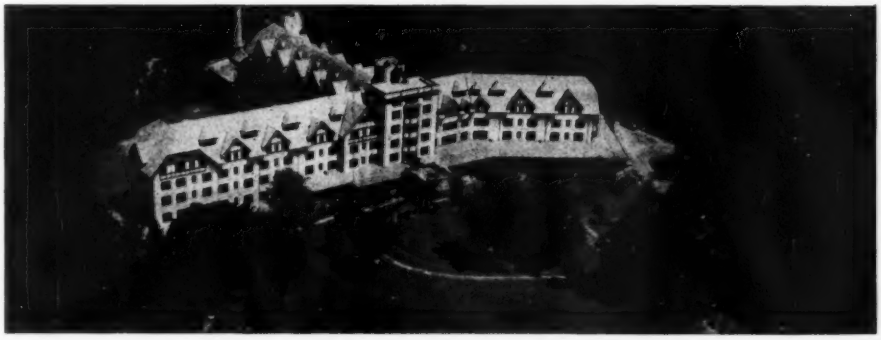

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